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# PROGRAMMES AS INSTRUMENTS OF CO-ORDINATION[1]

## I

PROGRAMMES are an administrative device which may or may not have an economic purpose. In a development programme the purpose is obviously economic, but in the world of entertainment where, so far as I know, published programmes were first used, the purpose is almost entirely organisational. A concert programme, for example, advertises what is to be played, by whom, in what sequence and at what times. It serves both to organise the performance itself and at the same time as a means of communication between the performers, and the concert-going public, just as a railway time-table, which is another kind of programme, simultaneously organises railway services and informs the travelling public what trains are running, so that they in turn can make appropriate arrangements.

The programmes that I shall be discussing are rarely addressed to the consuming public. Some of them—for example, the development programme of an under-developed country—may have the same advertising function as a concert programme and be intended to fill the consumer with hopes of future enjoyment. But the principal function of most programmes, whether they are used by an individual firm, by Government departments in war-time, or by the central planning organisation of a Communist country, is to serve as an instrument for the co-ordination of productive activities.

This function is most obvious at the level of the individual firm and in the type of programme that is the most frequently used by firms, namely a production programme. In any large organisation

[1] This is an abbreviated version of a lecture at the Institut Universitaire d'Etudes Européennes, Turin, January 1961.

where many workers have to be assigned fresh tasks every day, it becomes cumbersome to make decisions on each occasion without reference to a plan of work laid down in advance. Inputs of materials and components as well as of labour have to be adjusted to the outputs eventually required; and the longer the interval between input and output and the greater the variety of materials and components incorporated in the finished product, the more difficult it is to place orders without a production programme. Such a programme, when drawn up, covers a fixed period of time, and shows the outputs of various commodities which it is planned to produce during that time. This allows all operations to be phased and co-ordinated in relation to the outputs to be produced. It also reveals any shortages in labour and materials that are likely to arise and any future bottlenecks in capacity. For this reason it provides a basis for the recruitment of labour, and for inventory control, ordering of materials, and new investment in additional capacity.

Production programmes illustrate the three principal characteristics of a programme in the sense in which I shall use the term. First of all, they are quantitative in character: they are statistical time series relating to the future, not the past. The quantities, although expressed as amounts, are in fact rates of flow over time and differ in this respect from the quantities that normally figure in contracts—a difference that very often produces friction between those who administer programmes and those who administer contracts. Secondly, these quantities are usually in some sense allocative: that is, the different rates at any point in time add up to a fixed total which the programme sub-divides between competing uses. Thirdly, the quantities tend to be specified in physical rather than financial terms. It would be possible to extend the term 'programme' to cover similar financial statements, but the more usual expression is 'budget'. A budget is a programme drawn up by a consumer. At the national level, in a country with a consumer rather than a producer bias, the central budget is not only the spending programme of the government but can indeed act as a substitute for a development programme.

There are many programmes with the characteristics that I have listed. In addition to a production programme, a firm may have a buying programme and a sales programme extending over the same, or perhaps a rather different, period of time. Then it may have an investment programme to co-ordinate capital expenditure. At the national level there may be a host of programmes: for imports and exports; for different raw materials; for military aircraft; investment programmes; training programmes; and so on. Sometimes, to confuse

matters, other terms are introduced: for example, ' plan ', ' projection ', ' target ', ' perspective '.

The use of these different terms derives from two circumstances. The first is that some so-called programmes are no more than calculations intended to help decision-taking while others embody the decisions themselves. I am concerned only with the second type of plan or programme: but I do not wish to detract from the importance of working out the consequences of economic decisions in parts of the economy not under the control of the programming authority. A programme should be an effort of imagination as well as a plan of action.

The second circumstance that gives rise to terminological confusion is that different programmes have not only different purposes but different time-horizons. A firm's investment programme, for example, is likely to cover a longer period of time than its production programme and may bear less and less the aspect of a programme the further ahead it extends. The production programme for the next three months may be a firm plan of production while the investment programme for the year after next may be no more than a target at which it seems reasonable to aim, or a sketch of what might be done if no major change in circumstances occurred.

These differences in time-span arise also at the national level. Communist countries, for example, often divide responsibility for short-term, medium-term and long-term planning between separate units. The first presumably relates to annual output plans, the second to plans for increasing capacity over periods of up to five years or so, and the third to those larger changes in the economic framework that can be brought about in the long run through better education, more research, and so on, as well as to those structural changes that may be necessary in order to adapt the economy to long-term economic trends. At the one extreme is the severely practical problem of organising current output while at the other is what is now described by Communist writers as ' perspective planning '.

Obviously, if one takes a long enough span of time one needs imagination and very little else in order to plan; and the plans, while they may come to exercise great influence like all the best fiction, will be dreams rather than programmes of action—' guess-plans ', to use Stalin's derogatory description of them. On the other hand, if one takes a very short span of time it is very easy to end up with a programme that does not control events but is controlled by them. The programme may be constantly amended, not in order to give effect

to new decisions, but to conform to the expected course of output over a period too short for fresh decisions to make much difference. The time-horizon of a programme ought, therefore, to be long enough to serve as an indicator of action, not a mere forecast of what has passed beyond decision; and it ought at the same time not to be so long that it extends to a period about which no decisions need yet be taken.

## II

Programmes serve five distinct functions:

(i) They register decisions. Any decision to change production can only become operative when it is reflected in a programme amendment.

(ii) They communicate decisions. They are a simple, unambiguous[2] and economical way of telling every one what operations have to be carried out, whether they participated in the preparation of the programme or not.

(iii) They clarify and force decisions. In the course of drawing up a programme it is necessary to agree on what is to be inserted and what is to be excluded. This agreement is possible only if decisions have been made on the policies to be pursued and the success likely to attend these policies, the programme being a kind of summary of the policies and a way of giving effect to them. The programme also forces attention on any obstacles to its fulfilment, and so helps to bring about earlier decisions for overcoming them. Eventually, it becomes the focus of all decisions affecting production.

(iv) They provide a measure of the success of earlier decisions. If the carrying out of these decisions leads to the fulfilment of the programme, the firm can take pride in a piece of successful planning. On the other hand, any divergence from a programme showing what a firm planned should happen can usually be interpreted as a failure to plan correctly. Efficiency in planning is not the same as efficiency in production but is an element in it and there is a high correlation between the two.

(v) They allow decisions to be delegated. They not only communicate the decisions of a higher to a subordinate authority but provide an instrument of delegation to it. They constitute the marching orders of the subordinate authority in those fields where it is possible to lay down a general strategy; and they are at the same

[2] Not entirely unambiguous. My experience is that those who take programmes too literally can be a greater danger to good organisation than those who add an excessive amount of salt.

time a basis for the review of the subordinate authority's performance.

These functions are fulfilled by production programmes at whatever level they are used. An economic development programme, for example, is also a register of decisions, a method of communicating decisions, a focus of decision-making, a method of delegating decisions and a measure of the success of the plans which it embodies.

Each function has important corrollaries on which I propose to touch briefly.

(i) For example, no firm imagines that once a programme has been worked out it must be maintained inviolate or that those who prepared it can go on holiday for a stretch. This follows at once from the first of the functions that a programme performs: it is a register of decisions. As a register, it cannot be closed so long as fresh decisions may become necessary, since it has to be constantly amended with each new decision. This is true of all programmes: what matters is not the programme but the effort of foresight that goes to its preparation, and the continuous process of amendment by which it is kept up-to-date. The idea that you need only prepare a plan once every five years is complete nonsense. A fixed plan is not only worthless but dangerous: all planning that makes contact with the real world is re-planning. The activity of planning is far more important than the end-product, the plan; and the activity consists fundamentally in trying to secure, not just that decisions are taken in a different way, but that different decisions are taken. This cannot be achieved by treating programmes like the phoenix, as if they should take wing every five years or so from their own ashes; it can be achieved only if they are kept continuously alive by amendment and are used, as I have suggested above, as the focus of decision.

(ii) Nevertheless, new programmes do get issued from time to time and the fiction is often maintained that intermediate amendments are comparatively trivial and of no significance to the public. To give publicity to amendments blurs the image of a resolute management following confidently the path it has chosen. On the other hand, a new programme may not only confirm this image but is justified by the second of the functions which I have mentioned—the need to communicate decisions. A new programme gives amendments fresh authority by codifying them and tidies them up so that they cannot be overlooked or treated as stopgaps unrelated to the rest of the programme. Just as the railways are obliged to issue a new timetable periodically, although the timetable is changing all the time, so any planning organisation likes to start afresh from a new fixed point

at regular intervals and use the opportunity to review the programme as a whole.

(iii) A programme is a focus, not a substitute, for decision-making. It is a mistake to suppose that nothing ever gets decided or 'planned' until there is a programme. Just as it is nonsense to equate planning with the publication of a quinquennial programme, so it is nonsense to think that a programme settles everything and that no sensible decisions can be taken without one. It furnishes no more than a systematic way of trying to co-ordinate decisions and improve on unco-ordinated decisions. Although unco-ordinated decisions may be bad or costly so also may co-ordinated decisions: there is no magic about a programme that transforms the quality of decisions beyond the virtue that co-ordination lends.

I make this point because some people are puzzled how one ever *begins* to prepare a programme[3] when the truth is, in a sense, that one never *begins*. One starts from a world that is already moving, not one that has to be set in motion. There are nearly always plenty of plans and the problem is chiefly one of choosing between them, giving scope to the more promising and trying to ensure that what is left is, as far as possible, self-consistent. No doubt one can travel away from a world where initiative is dispersed and there are many programmes towards a world in which, in principle (but never in practice), there is only one all-embracing programme for the entire economy. There is also a formal difference, and sometimes more than a formal difference, between programmes for publicly and privately operated enterprises. But it is only if one starts out from sheer administrative chaos—as did happen in the U.S.S.R. after the civil war—that programmes take shape out of nothing instead of out of existing programmes.

(iv) The fourth function of a programme, to provide a measure of the success of earlier decisions, means that the programmes to which firms work under capitalism can never be purely physical. Since the crucial test of success is one of profit or loss there must always be, in addition, a financial constraint. Sometimes this constraint makes itself felt only in the longer run when a drop in profits or an outright loss forces a change in programme. Sometimes the constraint is made more immediately effective through a system of budgetary control and standard costing. Implicitly or explicitly, there is a financial programme alongside the physical one. Moreover, it is the financial programme that takes precedence. The physical programme has an

[3] The same bewilderment was common during the war when the layman started to talk about the preparation of aircraft programmes.

economic purpose and the final test of its success is not just whether it is fulfilled but whether when fulfilled it yields a balance of advantage to the firm. The values in which this advantage is measured are the values of the market and are consequently external to the firm. The programmes of the firm have, therefore, constantly to be adjusted by reference to external indicators unless the firm is to be involved in financial losses.

(v) These external indicators take the form of prices and costs. The significance of market indicators varies with the type of market in which they are determined; but the more free the market is, the more they give expression to the values of the ultimate consumers and producers in whose interests the economic system is supposed to function. Where prices and costs do have this significance, even approximately, the activities of firms can be co-ordinated from without by market mechanisms and the need to co-ordinate from within through programmes is correspondingly reduced. To put the matter the other way round, the existence of market indicators allows a much greater power of delegation and dispersion of initiative because subordinates can make use of an objective criterion of success in their decision-making.

That this is true at the national level is well recognised. The state is content to leave private firms a large measure of independence because it is confident that market forces will orient their planning to the public advantage. But exactly the same is true within large firms operating several branches. The fact that these branches can be given a simple objective such as the need to show a profit and can use external indicators to guide their reactions makes it much easier to allow them considerable autonomy. Moreover, just as the firm may seek to maintain some degree of control over its constituent units by supervision of selected programmes the same is true of the state, which may content itself with reviewing those economic aggregates such as investment and consumption, imports and exports, electric generating capacity, and so on, which it adjudges of critical importance to the uninterrupted growth of the economy.

Programmes, therefore, furnish a convenient instrument of delegation—the last of the functions already listed. Indeed, in some situations where market indicators do not exist, there is practically no other basis of delegation, except in the most general terms, and the programme then provides an unqualified measure of successful performance. As I shall show later, it is precisely when there is no market, or when market indicators are superseded or distrusted or enfeebled

by excessive pressure of demand, that programmes come to dominate administrative action.

I need hardly insist that there is no value in a programme if it does not influence action. There is no point in taking decisions unless they are carried into effect—and programmes are simply a tool for decision-making. This may seem obvious enough in a firm where programmes are usually based on or backed by orders already received or confidently expected and contracts already placed or about to be placed, so that the links between programmes and their execution are necessarily close. But at the national level the links between what is planned and what actually happens are often distinctly tenuous.

## III

That programmes assist good organisation and can enhance productive efficiency goes without saying. It is not surprising, therefore, that many countries as well as firms make extensive use of programmes and that they sometimes become the basis for running an entire economy. In Communist countries one sometimes gets the impression that the government thinks of itself as a large joint stock company whose shareholders are the next generation. The economy is organised much like a very large firm and the resemblance is particularly evident in the use that is made of programmes as an instrument in economic decision-making. There are, however, differences in the way in which the programmes are prepared—for example, in the influence exercised by market forces. The attitude of the government is not only that of a producer rather than a consumer, but it is that of a producer who calls the tune and can, within limits, tell the consumer what he is to be allowed. In other economies where development programmes are used, the consumer occupies a stronger position and market forces are not so consistently over-ridden. There are also many countries that make little or no use of programmes just as there are many firms that have no production programmes. This suggests that whatever the advantages of programmes they do not lie uniformly on one side and that there may be serious limitations to their use.

The nature of these limitations has already been explored by economists in two different branches of economic theory which are rarely brought into association with one another. In the theory of the firm, they have stressed the difficulty of maintaining administrative efficiency in large and complex organisations; if size at some stage of growth becomes a competitive handicap, then there is correspondingly

less scope for programmes, which are a palliative but not a cure for the inconveniences of size. In the theory of value, economists have approached the problem from the outside instead of the inside and have demonstrated the importance of an external frame of reference in maintaining the economic efficiency of productive units. This external frame of reference is provided by a free market in which the plans of producers can be linked with those of consumers. Market forces, by causing both producers and consumers to vary their plans, are an effective—but not necessarily ideal—method of co-ordinating productive activity and directing that activity towards the satisfaction of consumers' wants. The market mechanism operates whatever the form of organisation used by producing units and tends to eliminate those forms of organisation that fail to withstand competition. Thus the use made of programmes by individual firms is limited by the need to prevail in competition for a market with other firms that do not make use of programmes; while at the national level, the market by enabling production to be co-ordinated through the price-mechanism provides a substitute for the centralised programme that might otherwise be employed.

These are not, I hope, matters that I need elaborate and qualify. For present purposes, all that I wish to establish is that the market is a solvent of complex forms of economic organisation, that the more use is made of the market the less need there is for development programmes and that, conversely, the greater the effort to plan and organise an economy from the centre the more difficult it is to enjoy decentralisation through the market. Carried to their logical conclusion, production programmes co-ordinated at the centre could transform the entire economy into one large firm. On the other hand, carried to its logical conclusion, the price-mechanism is capable of eliminating the administrative structure that we call a firm and substituting for it a series of *ad hoc* bargains between individual producers. We recognise at once the absurdity of trying to make the market do duty for all the organisation that goes on within a firm; but do we recognise the equal absurdity of trying to organise for the benefit of consumers without allowing market forces to operate?

The limits to the use of programmes in substitution for market forces do not arise simply from size. Economists are now a great deal more sceptical than they used to be whether any loss in efficiency need result as a firm grows in size. It used to be argued that there was an optimum size of firm and that beyond this optimum, managerial efficiency deteriorated. Nowadays it is more common to argue that while there may be a limit on the *rate of growth* of a firm without

loss of efficiency, firms can adapt their administrative structure as they grow and that, while their costs may show little reduction they are unlikely to show any increase.[4] If this is so, it would seem to follow that all the firms in an economy could be amalgamated and run by the state as in a Communist society, without any sacrifice in administrative efficiency.

This is not, however, a corollary that I find it possible to accept. One cannot discuss the efficiency of a productive unit without reference to its purpose, and this purpose must embrace the satisfaction of the consumers' wants. However efficient a central planning organisation, how can the programmes which it devises be as sensitive an instrument as the market for giving the consumer what he wants?

Notice that I do not say: 'for co-ordinating production'. It is certainly arguable that production can be organised efficiently in a single large unit: every army, after all, has to get along without using a market to decentralise decision-making. Notice also that I do not assume that the consumer should always get what he wants: it may be more important to change the structure of the economy so that the next generation of consumers will get more. But if the problem is how to maintain efficiency *in meeting the demands of consumers,* can a firm grow until it swallows up all other firms without losing touch with those demands?

It does not seem to me sufficient justification to say that where there is a divorce between government and consumer priorities, there must be programmes that guarantee precedence to the government. Everybody recognises that such a divorce can exist: that there may be a conflict between what consumers will buy on the market, if permitted, what they will vote for through their government representatives, if they have any, and what the government, with their agreement or otherwise, is prepared to allow them. Everybody would agree that the government would be justified in imposing its own priorities if it could establish that consumers were short-sighted or ignorant, or if it were trying, with the agreement of the electorate, to improve the social and economic framework within which consumers and producers form their private plans. But the government has other ways of making its will prevail. It can tax or borrow, and range itself alongside the consumer in the market instead of trying to supersede market valuations through programmes. The budget offers it

[4] See, for example, E. T. Penrose, *Theory of the Growth of the Firm* (Blackwell, 1960). P. S. Florence, *The Logic of British and American Industry* (Routledge and Kegan Paul, 1953) and R. B. Heflebower, 'Observations on Decentralisation in Large Enterprises', *Journal of Industrial Economics,* November 1960.

an alternative, less drastic, instrument of planning the economic system.

Even those who see no necessary decline in efficiency with size agree that there are some types of economic activity in which small firms predominate. The reasons for this predominance, and for the concomitant absence of production programmes in these small firms, include two which seem to me of special relevance. First of all, where it is necessary to follow the market closely and give customers personal attention, supplying products exactly adapted to their requirements, it is difficult to manage a firm of any size and equally difficult to make use of a production programme. The same is true, secondly, where changes—particularly changes in market conditions—are rapid and unforeseeable so that production decisions have to be taken frequently and quickly. The use of a production programme assumes on the one hand that the producer can to some extent call the tune and on the other hand that his time-horizon is not limited to the immediate future.

Now these are two highly important limitations. A longer time-horizon—to begin with the second—is one of the more important elements of novelty when administrative action comes to be based on programmes rather than on *ad hoc* methods of co-ordination. A greater effort is made to foresee surpluses and shortages, to predict exact delivery dates, to secure consistency between the more remote and the more immediate consequences of current decisions, to study the needs for action before it actually arises. An important merit of a development programme is that it operates to exact a similar effort of foresight and extend the span of time that is brought under review; it does so not only for those who are preparing it but for the public on whose behalf it is prepared. If, however, a firm or a country is obliged to live from hand to mouth under conditions of rapid change that would make a programme out-of-date by the time is was prepared, the possibility of taking and adhering to a long view does not exist. A stable programme requires some stability in the circumstances to which it relates; a highly unstable programme is likely to be worse than none at all.

The other limitation arises out of the fact that a firm has to sell what it produces. If it has to hunt around for markets it cannot plan its production without running considerable risks. Since all production is in advance of consumption some of these risks are inescapable, and if production is to be efficient other risks have to be assumed in the shape of heavy capital commitments. But the risks are obviously much less in a seller's market than in a buyer's market; and it is

probably significant that in Britain at least the rise of production programmes took place in the seller's markets of war and post-war years. Firms were able to count on large contracts that kept them working to capacity. The limiting factor in their activities became production rather than sales and they had therefore every incentive to plan the use of their capacity for a long period ahead so as to obtain the maximum output. If, however, there are no long order books and customers will not wait for delivery, output may have to move from its pre-established path to meet new and unexpected requirements, programmes begin to lose their firmness and planning relapses into improvisation.

These limitations to the use of programmes in a firm—the need to offer the customer what he will buy and the need to take advantage of changing circumstances—still apply at the national level.

It is conceivable that the first limitation might completely lose its force. The government of any country is usually itself a large buyer of finished goods. If, to take an extreme case, it were the *sole* buyer and consumers merely took what they were given without grumbling, it would be impossible to organise production until the government had made up its mind what it wanted. No one else would have any say in the matter and there would be no alternative indicators to which business enterprises could turn in order to decide what to produce. Naturally when one talks of the government making up its mind, it is no single mind that has to be made up but the minds of a great many people in positions of authority who may disagree with one another. However erratic the process of decision-taking may be; however frequently decisions are reversed and action is countermanded; however long it may take to bring inter-departmental consultation to a head and wrest a decision from vacillating officials; if the government masquerades as the sole consumer of final output, there is no short-cut by which its requirements can be established. The government alone can tell what the government will do. Once it has decided, it need not make use of any market or other mechanisms to state its requirements. It need merely proceed directly to draw up production programmes in agreement with whatever business units it maintains. These programmes will simultaneously give expression to government demand and to the possibilities of supply over the period to which the programmes relate. Demand and supply will be equated by administrative action without reference to any system of prices. The market limitation on programmes disappears for the simple reason that the market disappears.

Now although this is an extreme case it is not so very far removed from a variety of circumstances in which programmes are used extensively by governments. In war-time, for example, the government employs a high proportion of the available man-power either in the armed forces or producing equipment for them; and although civilian requirements remain large and are procured through the market, government requirements take precedence whenever there is any conflict of priorities. As Professor Devons has pointed out, the government tries to behave like a single consumer with a single set of priorities derived from the strategy by which it proposes to conduct the war. Civilian needs take their place within this strategy but are subordinated to it and it is the war strategy that governs production not the spending of consumers. Firms making against government orders need not necessarily use production programmes or they may construct their own programmes from the orders in hand; but as war-time organisation improves there is an extension of programming and a great effort to bring the priorities in the programmes into line with priorities decided upon centrally.

The same kind of reasoning can be applied where a great structural upheaval is in progress—associated, for example, with industrialisation —and the restructuring of the economy is accorded (willingly or unwillingly) absolute priority over the immediate satisfaction of consumers' wants. If the government elects to impose its own priorities and treat the transformation of the economy like a military operation, it is likely to have to clothe its priorities in the form of production programmes and apply compulsion similar to conscription and direction of labour on the one hand and rationing and licensing of consumers on the other.

The extent to which it can use programmes, however, must depend upon how far it is itself the consumer of final output or in direct control of producing units. If there is a large private sector, as in non-Communist countries, the government's power to control it is necessarily limited. The government may attempt to 'administer' civilian markets by limiting supplies, regulating demand, fixing prices, imposing taxes and so on, or by more drastic measures such as requisitioning, direction of labour, and so on. But the efficiency of these controls is as limited as the abilities and incorruptibility of those who administer them; and the programmes drawn up by the government may remain ineffective because market forces prove too strong.

The second limitation is the fact of change. A world free from change would be a world of routine in which there would be no need for organisation because everything would have become perfectly

organised, no need for managers, because there would be no fresh decisions to take, and no need for programmes because everything would already proceed in a fixed sequence and at fixed times. Programmes are also out of place in a world of very rapid change in which foresight becomes impossible. In such a world it is unwise to lay down a fixed path because the one thing that one can be sure of is that it will be necessary to leave it. One has to make some working assumptions, remain prepared to change them, and improvise to the best of one's abilities.

Now consider the implications of rapid change in a centrally planned economy. If it is insisted that all programmes must be fixed centrally then it is necessary for the central planning staff to obtain information of the changes affecting each programme; to engage in all the necessary consultations in order to amend the programmes; to review the repercussions of these amendments on inter-related programmes and amend them too; to promulgate all the amendments; and to see to it that the process is completed so quickly that no fresh change makes the whole set of amendments out-of-date before effect can be given to them. Needless to say, for any but the smallest and simplest type of economy this adds up to a complete impossibility.

Given this impossibility, the central planning staff has to limit the number of programmes in which it interests itself directly. During the war, the Programmes Department of the Ministry in which I worked deliberately restricted itself to about a dozen items, knowing that any attempt to keep track of a larger number would distract the key members of the staff from their major task or would make it necessary to recruit a larger staff than could be readily co-ordinated by the informal but effective methods we employed. In the same way, I gather that in most Communist countries the central planning organisation has in recent years come to limit the number of commodities for which it prepares programmes. In Czechoslovakia, for example, the number has been reduced from 1,500 to about 200, and in the U.S.S.R. from 5,000 to a few hundreds. This leaves the work of preparing programmes for other less important commodities to subordinate organisations: in war-time Britain, to the production as opposed to the planning department of the Ministry or to the principal contractors to the Ministry; in Communist countries, to the planning authorities of individual states or regions or to trusts and other trade organisations.

But as soon as such delegation is accepted as a necessity it is no longer possible to ensure that programmes are co-ordinated, and it becomes necessary, the further the delegation is carried, to find substi-

tutes for the market indicators which enable a large private firm, faced with a similar programme, to delegate planning authority to its branches and subsidiaries.

Nor is a limitation in the items programmed centrally the end of the matter. Each of the weaknesses that comprehensive planning encounters also afflicts the central planning of individual items. First, there is the problem of information. When changes occur, how can the central planner know all that is in the mind of the man on the spot where the change is taking place? How can he convey all that is in his own mind? As a central planner he may be confident that he knows what the government wants better than the producing unit; at the same time, the manager of the producing unit knows far better what the government can have. But if demand and supply—as we may think of them both—are far apart, are administrative methods well adapted to bring them together? For real co-ordination, each should know the range of alternatives open to the other, and the terms on which one alternative might be substituted for another. When there is a market to react to, this kind of dialogue does occur between each buyer and seller and market prices. But in the absence of a market, the dialogue has to become a tête-à-tête not the long-distance telephone conversation that is all that may be possible.

Programmes can be operated centrally only if information not previously available is collected. This information, most of it statistical in character, *takes time* to collect, is often difficult to interpret, and has a different coverage at one time than it has at another. Thus there is a constant danger that the information available will give a misleading picture of the current situation, that a wrong construction will be put on the limited data supplied, and that the data will be more useful for dealing with last year's problems than this year's. The fact that the data are statistical means also that those who run a centrally planned economy may give excessive weight to quantitative considerations and are likely to include a disproportionate number of people who have specialised in handling statistics (as opposed, for example, to handling people).

A further limitation arises out of the need for continual consultation. Here again there are problems of time and of communication. The central planner's sole advantage over other people is that he has access to information about what is happening right across the economy and about what the government proposes to do. But to make use of this access takes time. His stock of information is a rapidly

deteriorating asset unless he makes a heavy investment in the study of current documents and in consultations with his colleagues. However hard he tries, he cannot know everything relevant to the decisions that he is called upon to make. Whenever an amendment to programmes becomes necessary, he may discuss the proposed amendment with those of his colleagues who are affected but neither he nor they can see the full implications, however much time they give to considering them. For the need to specialise in their own field limits their vision and knowledge. It can easily happen that the colleague most concerned is not even told because no one was aware that he was about to come forward with an amendment that would make nonsense of the change under discussion.

In an economy which is not centrally planned these limitations are made effective by financial sanctions. If programmes are not altered quickly, when demand changes, the goods produced cannot be sold. But these sanctions need not operate in a Communist country, even where the goods are made for a civilian market. It is a matter of principle in those countries to keep demand slightly ahead of supply—i.e. to maintain a seller's market—so that at any time there are bound to be some shop-shortages and an incentive to take what can be had rather than wait indefinitely for what is not to be had. It is partly because of the seller's market that the emphasis can be thrown so strongly onto production: there is every incentive to plan the use of capacity for long periods ahead if there is no difficulty in marketing the output.

The price of production programmes in these circumstances, given the inherent imperfections of planning, is thus exactly like the price of a long-term contract—the necessity to assure a market even when the output may be unsaleable. The assurance need not, of course, have an unlimited span: after a time, capacity can be changed over to more acceptable goods and junk produced in the meantime can be unloaded at a loss. But the output lost during the changeover may be heavy and the loss on the sale or scrapping of junk even heavier. It may, for example, take as much as six months before production of an item no longer wanted can be brought to a stop. I know very little of the experience of Communist countries in such circumstances but I have very lively recollections of the shifts to which the British Ministry of Aircraft Production went to during the last war in order to keep a productive unit in operation: factories scheduled to go over to Typhoons continued to turn out Hurricanes by the score long after there was any apparent use for them.

## IV

The fundamental problem of planning is thus to find the optimum degree of decentralisation. In centrally planned economies the risks are run on the side of over-centralisation because the mechanisms that are favoured—co-ordination through programmes—lend themselves to centralisation. In the industrial countries of the west the risks are run on the side of excessive decentralisation because the mechanisms that are favoured—co-ordination through market forces—promote decentralisation. In the first type of economy the planners are prominent, few and powerful, while the second type of economy, being full of well-managed business enterprises, suffers from too many planners rather than too few. Its methods of co-ordination tend to be much less direct and to make much more use of the central government's budget, which operates as the principal instrument for regulating the pressure of demand and controlling the balance between the principal sectors of the economy. The government tries to co-ordinate its spending plans with the spending plans of other consumers, leaving producers to draw up their own programmes to meet the resulting market requirements. It may also seek to influence the rate of capital accumulation, the balance of payments, the distribution of industry and so on. But in its efforts to co-ordinate production it usually intervenes on the side of demand rather than supply, using financial means impinging on the budget rather than physical controls giving effect to programmes.

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# A FAIR DAY'S WORK

## I. The Problem

Boulding[1] defines the task of the social scientist in regard to ethics as that of teaching us 'what moons we should not cry for'. He writes: 'The great object of social science, as of all science, is to find out what is *possible*'. For not all ideals are capable of achievement. And perhaps the vision of being able to base fairness on measurement is one of these. Yet, we find that work-study engineers often conceive their task as the measurement of a fair day's work.[2] And the concept of a fair day's work, as well as that of a fair day's pay, plays an important rôle in modern industrial society, both in wage-negotiations and in industrial disputes. The phrase is bandied about freely by trade unions and managements and both sides think that they know what they are talking about. Yet the notion of a fair day's work is something of a will-o'-the-wisp—the more closely one examines it, the more elusive does it become.

This article examines some of the difficulties associated with the use of this notion. It sketches briefly the nature of the difficulties, and then explores the questions of how production standards are determined in practice, and how they are related to the ideal of a fair day's work.

A fair day's work may be defined provisionally as the amount of work which some ethical code demands *ought* to be performed; the amount which is neither too little nor too much, but right. Thus the concept of a fair day's work is an ethical concept concerned with setting a standard for work conduct. Within this ethical frame of reference work is viewed as an obligation, and the individual's contribution to society as an honest—a fair—day's work. The existence of this goal makes itself felt in the form of strong moral pressures which may make us feel that we ought to be working when we are doing

[1] K. E. Boulding, *The Organisational Revolution* (Harper & Bros., New York, 1953), pp. xiv-xv.

[2] Compare for instance, P. Carroll in the foreword to R. Presgrave, *The Dynamics of Time Study* (McGraw Hill Book Company, New York, 1945), pp. xv and xvi: 'We continue to set up standards which purport to measure a fair day's work', and 'a number of time-study men, engineers and consultants are striving conscientiously to attain the fair measurement of "a fair day's work".' And T. A. Ryan and P. C. Smith, *Principles of Industrial Psychology* (Ronald Press Company, New York, 1954), p. 346: 'Jobs are timed and time standards set to determine what constitutes a fair amount of work to be expected from a worker in a day.'

nothing.[3] This does not mean that everybody necessarily accepts the goal of a fair day's work or experiences guilt feelings or responds to moral pressures. But all arguments about a fair day's work (such as are encountered in discussions between management and trade unions) imply a conviction that there is a level of work which is right. It is wrong to do less than this, and it is wrong (unfair) to ask people to do more than this. These judgments are clearly normative in nature.

But *how much* work is a fair day's work? Here we deal with an abstract concept which needs to be translated into concrete (preferably quantitative) terms in order to be useful as a guide to conduct. Can the notion be translated satisfactorily into standards for a day's work, and if so how? How should a day's work be envisaged, in terms of a given output of results, or a given input of effort, or a given input of time, or in terms of a particular combination of these variables? This is the basic problem and dilemma.

The problem of visualising what should constitute a day's work is encountered in all types of work, for it is universal, but it will be considered here mainly in relation to factory work.

It must be stressed that visualising standards for a day's work is not merely an ethical problem; it is also an important economic and managerial one. Production planning has to be based on some sort of estimates of standards of production. For production standards affect costs, prices and delivery dates, and it is vital for management to have control over these.

Yet the employment contract, concluded when a worker is engaged, does not define the amount of work a worker is expected to do; all it does is to fix a wage-rate, to lay down normal working hours, and to stipulate the type of work to be done. The reason for this lack of precision is uncertainty. The employer cannot define future tasks clearly in advance. He needs flexibility to adjust to changing conditions. Thus, what the employer purchases is not a given series of services but a supply of effort for performing particular types of services involving changing work-assignments. He cannot define beforehand the exact nature of these assignments, nor how often and how quickly the same tasks will have to be performed.

[3] Even when work is slack people may experience feelings of guilt because they are doing nothing. For having no work to do conflicts with the individual's conception of the work situation and makes him or her feel uncomfortable. Clerical staff, for instance, often feel restless and dissatisfied when they run out of work; yet they may refuse to go home because they feel they ought to be at work; there ought to be something they could do. Factory workers too have been reported to have reacted against such situations by changing their jobs.

Again, he cannot define the amount of effort which he expects because effort is a subjective experience not a measurable substance.[4] An individual can compare and judge whether the effort he expends on a job in a particular time-interval is greater or smaller or equal to the effort he has expended on that or another operation in the preceding time-interval but he cannot define the amount of the difference quantitatively. Only the product of his application of effort—output—can be measured where it consists of concrete output units.

Thus, while an ordinary sales contract can be quite specific with regard to the price to be paid and the quantity and commodity to be sold, the employment contract can only give a vague outline of the contractual obligations for which a price is paid. Simon[5] argues that the essence of the employment contract is that the worker agrees to accept the authority of the employer to select a given set of tasks for him out of a given area of tasks with the result that ' certain aspects of the worker's behaviour are stipulated in contract terms, certain other aspects are placed within the authority of the employer and still other aspects are left to the worker's choice '. Simon likens the acceptance of a job to the signing of a blank cheque. By accepting the authority of the employer the employee agrees to do what he is told to do. In theory this means that it is up to management to decide what shall be a day's work. In practice, however, the employee is often left considerable freedom as to the amount of work he will do. The lack of precision of the employment contract means that the standards of effort which are adopted in practice lie somewhere between the highest level which an employee can reach and the lowest level which an employer tolerates.

The amount of variation in effort which is possible differs from job to job and depends on type and organisation of work. It is small where the pace of work depends on technological rather than human factors, and it is great where the pace of work depends on human rather than technological factors. Thus, in a machine-paced job an operator may have little chance to alter his rate of working. For instance, in an engineering plant we were told[6] that effort could only be varied within

[4] Compare T. A. Ryan, 'Fatigue and effort in relation to standards of performance and systems of payment', *International Labour Review*, Vol. 65, No. 1, Jan. 1952, pp. 45-46. Ryan defines effort as ' an individual's experience of how hard he is working. At times he feels that he is working as fast as he can or is using as much strength as possible. This would be the maximum point of a scale, which would run from this point down to the point where he feels that he is just barely working at minimum speed or strength.' This is the sense in which the term ' effort ' is used in this paper.

[5] H. A. Simon, *Models of Man* (John Wiley & Sons, New York, 1957), Ch. 11.

[6] Enquiry described in H. Behrend, 'The Effort Bargain.' *Industrial and Labor Relations Review*, Volume 10, No. 4, July, 1957, pp. 503 ff.

very small limits because production was highly mechanised. And the executive of a textile plant reported that in spinning it was the machine which set the pace. Again, with continuous process production, as in the chemical industry, it is the raw materials and time which determine the rate of output.

By contrast, there are many jobs where the pace of work depends mainly on the operator. For instance, in bricklaying where the bricklayer usually sets his own pace, a wide range of variation has been observed.

In jobs where the pace of work depends mainly on the operator and where management sets no upper limit to production (where — as management puts it—the 'sky is the limit') the question as to how much work should be a day's work is open to a wide range of interpretations. To be asked to do as much as one can is not a precise order; it is an unsatisfactory guide to conduct which cannot easily be translated into concrete terms.[7] Where management realises these difficulties it often introduces work measurement and thus sets specific standards of production as a guide to conduct. This, however, is a topic that will be dealt with in a later section.

The lack of precision of the employment contract means that both employers and employees are continuously confronted with the question of how much work (on the particular tasks chosen) should be a day's work. This question may or may not be interpreted as an ethical question. The worker may ask: how much am I expected to do? OR how little can I get away with? The employer may ask: What is it fair to expect? OR how much work is required to meet a given order at a given date?

## II. The Employee's Approach

The employee's approach to this question will tend to be shaped by his outlook and experience. How much work he does will depend on his conception of duty. It depends on whether he conceives this in terms of the fulfilment of specific contractual obligations, in terms of set tasks, or in terms of the input of effort or of time. Evidence from research into restriction of output[8] suggests that the effort criterion is often applied first, particularly by the factory worker. Most indiv-

[7] It is plausible that many individuals find that the lack of a clear definition of their duties and of production targets, involved in such a situation, imposes considerable strain on them. They may feel a need for reassurance that they are doing what is expected of them. It may well be that there is justification for the opinion that it is just as unfair to provide no targets as it is to provide targets which are much too high.

[8] See, for instance, Roy's study, quoted below.

iduals, it seems, enter the work-situation with some idea as to what is the 'right' or expected standard of effort. They are aware that they have accepted obligations which imply that they should do a 'reasonable' (fair) day's work. Thus many employees show signs of guilt if they are caught doing nothing and many employees seem afraid of being censured for not working sufficiently hard. They are exposed to certain moral pressures which tell them that they ought to be pulling their weight. For a worker who is working too little is often condemned by his mates as a chiseler. Thus, as Roethlisberger and Dickson[9] have shown, the operators in the Bankwiring Observation Room in the Hawthorne plant observed a norm of conduct that 'you should not turn out too little work. If you do, you are a "chiseler"'. Again Roy,[10] studying restriction of output in an American machine-shop, found that although workers set ceilings to production 'machine operatives not only held back effort; sometimes they worked hard'. 'Sometimes, when exerting themselves to reach quota, they expended effort to the maximum.' On really bad jobs where they considered that they could not reach 'normal' earnings, however high their effort, they deliberately dropped their effort to the minimum; but on jobs with a chance of 'making-out' 'the machine operators with few exceptions put forth vigorous effort'. The study shows that the workers evaluated each new job with its managerial production standards and rates in terms of effort. Where the effort-evaluations indicated that the production standards were attainable they set out to reach quota. The reasonableness of output targets was judged in terms of what the workers considered the right standard of effort. This right standard lay well above the minimum effort standard. Thus, what evidence we have suggests that workers do not habitually operate at the minimum effort level and that this is not merely due to fear of dismissal.

It appears also from these studies that workers do not normally operate at the maximum effort level. The level which they adopt usually lies somewhere in between. Thus, in the Bankwiring Observation Room there was another norm of conduct that 'you should not turn out too much work. If you do, you are a "rate-buster"' and the operators were aware of the fact that they were capable of turning out

[9] F. J. Roethlisberger and W. J. Dickson, *Management and the Worker* (Harvard University Press, 1939), p. 522.

[10] D. Roy, 'Quota Restriction and Goldbricking in a Machine Shop,' *American Journal of Sociology*, Vol. 57, March 1952, pp. 427 ff., and D. Roy, 'Efficiency and "The Fix": Informal Intergroup Relations in a Piecework Machine Shop,' *American Journal of Sociology*, Vol. 60, No. 3, November 1954, pp. 255 ff., and D. Roy, 'Work Satisfaction and Social Reward in Quota Achievement: An Analysis of Piecework Incentive,' *American Sociological Review*, Vol. 18, 1953, pp. 507 ff.

more work than they did. Similarly, the workers in Roy's study set a ceiling to production.

It would appear that the employee's notion as to what constitutes the 'right' standard of effort originates in the home and school[11] and is, so to speak, imported into the work situation; here it is modified by experience, by managerial pressures, and by the social environment. The result is the establishment of an habitual standard of effort which workers tend to defend as right. The standard which is adopted may be affected by norms of output which have been evolved in the department, and may reflect group conceptions as to what is the right standard of effort in a given situation. Each individual has to strike a balance between his own approach and that of management and of his co-workers. Thus Coch and French[12] report that a new operator in the Harwood Manufacturing Corporation joined a group of girl pressers who were restricting their production to 50 units per hour, while the time-studied standard efficiency rating was equal to 60 units per hour. After 13 days in the department the new operator reached standard production. Thereupon she became the scapegoat of the group; this induced her to reduce her output to below 50. But when the group was broken up at a later date and the newcomer was left on her own she developed her own standard of production of 92 units per hour. In the Bankwiring Observation Room[13] the operators considered that the wiring of two equipments was a day's work, and observed this as a norm. But not all workers accept group norms. For instance, Dalton[14] found that a certain number of the workers in the machine-shop which he was studying disregarded group norms and became rate-busters. Similarly Lupton and Cunnison[15] describe the differential output records of 'conformers' and 'job-spoilers'. Dalton characterises the rate-busters as economic individualists who considered the acquisition of money a mark of virtue and were keen on upward social mobility and on accumulating savings. By contrast, other workers in the same shop considered group loyalty a cardinal virtue and adhered to group norms of output. The study revealed that most of the rate-busters came from farms or urban lower middle-class families, most of the restricters from urban working-class backgrounds.

[11] How this notion is formed is a separate research problem.

[12] L. Coch and J. R. P. French, Jr., 'Overcoming Resistance to Change,' *Human Relations*, Vol. 1, No. 4, August 1948, pp. 516, 519-20.

[13] Roethlisberger and Dickson, op. cit., pp. 412 ff.

[14] M. Dalton, 'The Industrial "Rate-buster": A Characterization,' *Applied Anthropology*, Vol. 7, No. 1, Winter 1948, pp. 5 ff.

[15] T. Lupton and S. Cunnison, 'The Cash Reward for an Hour's Work under three Piecework Incentive Schemes', *The Manchester School*, Vol. 25, No. 3, September 1957, pp. 234 ff.

Thus, it draws attention to the probable importance of the influence of outlook and social background on the response of individuals to managerial production standards and to group norms of production.[16]

Furthermore, the economic situation may play an important part in determining worker standards of effort. Fear of unemployment may lead to restriction of effort in attempts to spread the work. Again, full employment may lead to effort restriction in bargaining bids for higher wages.

Dissatisfaction and grievances may also lead to restriction of output; unfair treatment, so to speak, absolves the worker from the obligation to do a fair day's work; for if management neglects its obligations, the worker does not need to adhere to his. Thus, if wages are considered unfair or piece-rates tight, the result may be a lower level of effort.

In addition to viewing a fair day's work in terms of effort standards and the output which these will achieve, the factory worker needs to take account of working-hours. When does he conceive these as being fair? One could argue that the evidence with regard to the enjoyment, which the workers in Roy's study derived from loafing into the supervisor's face after completing the day's quota, suggests that they do not accept any obligation to put in a set amount of time. If they have completed their quota they feel entitled to loaf. They do not feel any obligation to work throughout the whole period of time scheduled for work. Other employees, by contrast, may feel that they ought to be working all the time while they are at work.

Claims by trade unions for the forty-hour week challenge the rightness of existing working-times and show up the development of powerful value-judgments about the right (fair) length of the working day. These pressures may well have initiated an overall shift in the climate of opinion of our whole society as shown by recent agreements on reductions in the working week concluded between trade unions and employers' federations or individual firms in a number of industries.

## III. The Manager's Approach

Like the employee, the manager will tend to be influenced by his outlook and experience in his approach to the question what should represent a day's work. Insofar as he comes from a different social background, however, he is likely to import different notions into the

[16] From his evidence Dalton hypothesises that 'the rate-buster is likely to come from a family of higher socio-economic level than that of other members of the work-group, or if he is not, he is trying to reach such a level. He is ambitious and his immediate goal is money' (p. 18).

work situation and to draw on different experiences so that his image of a day's work may differ considerably from that of his employees.

Moreover, for the manager this is not merely a question relevant to his own behaviour, it is also relevant to his managerial function. For he is responsible for the work-performance of his subordinates; and often this is to him by far the more important problem; how much work can he expect from his workers? Are they working hard enough? The manager considers he has a right to demand that his employees do a good day's work. Thus, his attention with regard to this problem is of necessity focused on the question of effort control.

It is essential for management to set up and enforce standards of production which ensure the firm's survival and safeguard or increase its profits. For this reason it is plausible that management's main frame of reference for judging a day's work is economic. Often, for instance, so much work may need to be done and there may be such a shortage of labour that the question whether the worker is doing a fair day's work or not is irrelevant; what matters is that he must get through more work to meet the needs of the firm, either by putting in extra effort or by working overtime. Again, if certain orders are placed with the firm with fixed delivery dates it may be essential to ask for extra effort to complete the orders so that an important customer is not lost to a competitor. Thus, management's prime interest would appear to be that of securing as large a day's work as possible. From the economic point of view, the higher the level of effort which it can secure, the better.

This desideratum does not, however, solve the manager's problem of determining how much work should be a day's work. For he cannot ask the impossible. The target which he tries to reach must be realistic, that is, possible of achievement. The question with regard to his employees thus is: What is it reasonable, or fair, to expect from them?

This raises a similar question to that posed with regard to the employee: how does the manager conceive what should be a day's work? Does he conceive it in terms of set tasks, or in terms of the input of effort, or in terms of the input of time? The economic criterion makes it likely that he visualises it in terms of the completion of specific (though changing) work allocations. In envisaging output targets he will be guided by the record of past performance. He usually knows what the habitual rate of output has been. In addition he may have at his disposal work measurement data and often he may conceive a day's work in terms of the standards set by work measurement. These imply the application of what is considered normal effort so that

the day's task is viewed in terms of the output of results per unit of time obtained from the input of normal effort standards.

Furthermore, the working week is envisaged as consisting of a set number of working hours. Thus the 44-hour week is still defended by many British employers' federations as the right length of working week. Recently, a shorter working week of between 40 and 42 hours has been accepted by others. Employees are expected to be at work for the full stint irrespective of whether they have completed their allotted tasks earlier or not. Thus speedier achievement of given results is not synonymous with reduced working hours. This seems to imply that the hours criterion of a day's work takes precedence over achievement and effort.

Insofar as management's conception of a reasonable day's work is based on past performance or on work measurement standards, it is liable to be conservative. Just as the employee tends to develop an habitual standard of effort and defend it as right, so the manager tends to defend as right the standard which he considers attainable normal performance. This may blind him to the fact that these standards are not the only potential standards.[17]

## IV. Conflicting Standards and their Adjustment

Management and worker conceptions with regard to the 'right' production standards in a given situation may or may not coincide. In some cases workers may believe that they are doing a fair day's work while management does not think so. And this may be a genuine divergence of opinion. When such a difference occurs, management may accuse workers of restriction of output, and workers may accuse management of slave-driving.[18]

In other cases management may be confronted with deliberate restriction of output. Again, management may consider that habitual standards of effort—be they fair or not—are too low to meet their economic needs: what the firm requires is an extra supply of effort from its existing labour force. For management must evaluate a day's

[17] For instance, J. Montague ('The Integrated Rating System—II', *Work Study and Industrial Engineering*, Vol. 3, No. 5, May 1959, pp. 167 ff.), argues that work measurement tends to preserve the *status quo* because it is based on predetermined time standards which do not allow for the possibility of the existence of different standards of normality. Again, the Coch and French and the Bavelas experiments showed that there were potentials not realised by work measurement (see n. 12 and n. 20).

[18] Compare O. Collins, M. Dalton and D. Roy, 'Restriction of Output and Social Cleavage in Industry', *Applied Anthropology*, Vol. 5, No. 3, Summer 1946, pp. 1 ff.

work not only in terms of past experience but also in terms of present and future needs. These may demand the raising of the level of effort.

Management often attempts to achieve this by the use of financial incentives. Basically the question of raising the level of effort is a question of getting the worker to agree to adopt higher standards of effort. Such agreement can only be obtained through bargaining. It is not a question of individual bargaining but of negotiating with workers' representatives or whole work groups; this makes it possible to use group forces and group norms as a basis for agreement. Bargaining involves concessions on both sides, and one of the most important concessions management can make is in regard to wages. In return for wage-concessions workers may agree to raise their standards of effort. Financial incentive-schemes provide machinery for such bargaining; their introduction represents the conclusion of an effort-bargain in which workers agree to raise their standard of effort in exchange for the guarantee of higher earnings (i.e. the agreed piece-rate margin). Proportionate increases are assumed in earnings and productivity. Where a piece-rate margin of 33 per cent. is agreed it is implied that productivity should also increase by 33 per cent.[19]

Alternatively an agreement can be concluded on output targets for specific tasks. For instance, in one experiment, it was shown that group-committal on targets could raise productivity well above the standard of 60 which had been 'efficiently set up by time and motion analysis'. In this instance the workers held three short weekly meetings to decide on a definite production target. To begin with they decided to raise production to 84 units per hour although 75 was supposed to be the ceiling. The goal was reached and the group set a new goal of 95, but only reached 92. Eventually production stabilised at around 87.[20]

Committal to production goals need not be linked to payment by results. A wage-increase on time-rates can be made into an effort-bargain by linking it to an agreement on output targets.

It must not be forgotten, however, that agreements on production standards refer to specific situations and specific tasks. As jobs and conditions change, conflicts arise, adjustments become necessary and new effort-bargains are worked out. In a dynamic situation effort-

[19] In evaluating the effectiveness of financial incentives managements sometimes quote increases in earnings that have resulted from the scheme and indicate that they believe this is an index of the increase in labour productivity. Earnings have gone up by a third, they may explain, this means productivity has gone up by a third.

[20] Research conducted by Alex Bavelas, as reported by N. R. F. Maier, *Psychology in Industry*, p. 151 (1958 edition).

bargaining is a continuous process requiring constant managerial attention.[21]

## V. Implications with Regard to the Notion of a Fair Day's Work

Arguments and agreements about standards of effort raise an interesting question: which of the possible standards represents a fair day's work? This problem is perhaps most clearly illustrated if one considers the effort-bargain which is contained in a financial incentive scheme and which lays down what difference there ought to be between output on time-rates and on piece-rates.[22] For it shows that there is—by agreement—a standard of effort which is considered right for time-rates, and a standard of effort which is considered right for piece-rates. Which of these two standards represents a fair day's work? Is the conception of what represents a fair day's work not something absolute but something relative, and if relative, what are the reference points? Is it a function of wage?

The concept of a fair day's work evokes the image of one particular right level of effort (the maximum effort point?) which is absolutely valid.[23] It suggests a correct standard of conduct which is independent of any system of reward. Does not each individual owe the same contribution to society, to give of his best?[24] This interpretation of the concept is contained in such admonitions as ' we must work as hard as we can ', ' we must do our share ', ' we must do our best '.

In abstract terms some people may find it possible to accept and think in terms of an absolutely valid standard of effort. As pointed out earlier the problem is that of translating the abstract standard into action. The question then appears to become one of what is fair in given circumstances to all concerned, to employee, management and society, and the answer to this seems to depend on the particular situation. It depends, among other things, on the particular goals of a society at a given time. Rules of conduct such as that of doing a fair day's work are means of achieving these goals and vary with them. In war-time, for instance, when survival is the over-riding goal, a higher level of effort than in peace-time is accepted by all as the right stan-

[21] Cf. Section VI below.

[22] In practice it is not possible to measure the actual difference, as the effect of financial incentives cannot be isolated. See H. Behrend, 'Effort-control through Bargaining', *Nature*, Vol. 179, p. 1106, June 1, 1957.

[23] Compare footnote p. 19 (Ryan).

[24] To trace the influence of religion on this concept would lead outside the scope of this paper, but the influence is obviously very important. See, for instance, Max Weber, *The Protestant Ethic and the Spirit of Capitalism* (1904), and R. H. Tawney, *Religion and the Rise of Capitalism* (1926).

dard. In peace-time when adequate leisure may be one of the goals of society this affects the amount of work that is considered a fair day's work. As the concept of what represents adequate leisure changes (for instance, with the claim for a 40-hour week) concepts of a fair day's work are revised. The goal of rising material standards of living (which is usually taken for granted in present-day Britain) depends on high standards of effort for its achievement.

Furthermore, it is plausible that habitual standards of effort or habitual output norms often come to be considered as 'fair' standards. Certainly they become reference points against which injustice and unfairness is assessed. Thus, in practice, certain standards acquire the status of being fair not because of any absolute merits which they may have or because of any quantitative justification which may be produced but because they do not strike the workers as unfair and are not attacked by them as unjust. The evaluation is made mainly in terms of subjective experiences of effort; the worker judges whether the amount of effort he is putting in is equal to his habitual standards of effort or not.

Thus different answers seem to be given in different circumstances implying that there is not one right standard of effort but many right standards according to circumstances. This would appear to be an inherent paradox connected with the concept of a fair day's work: that the concepts of an absolutely valid standard and of relatively valid standards are held side by side.

Since a fair day's work is an ethical concept, the question as to what constitutes a fair day's work is not a question of facts but of subjective judgments. These judgments seem to differ for different people and for different occupations and, as we have seen, for different circumstances; the most important of these in present-day Britain appears to be the level of employment and wage conditions. It must be noted that differences in value judgments cannot be resolved by recourse to science; there is no scientific criterion for judging the 'rightness' of any one standard of production as compared with another. The differences can only be resolved by mutual adjustment of incompatible standards.

## VI. Implications with Regard to the Role of Work-Measurement

This raises the question how this problem is resolved by work measurement. Foote Whyte[25] gives the answer 'by guesswork', and

[25] W. Foote Whyte, *Money and Motivation* (Harper Brothers, New York, 1955), pp. 17 ff.

explains that rate-setting is nothing but a ' guessing-game '. In the incentives inquiry mentioned earlier[26] it was admitted by all management representatives that there is an element of subjective judgment in work measurement. That this must be so follows from the fact that we have no means of measuring effort and that time-study involves the assessment of what is normal effort.[27] Judging this is easier if one can eliminate the technological variable. This is where work-study helps. Work-measurement makes it possible to standardise factors in the situation other than effort so that the standard of effort required may be judged more effectively, and standards for different jobs set as fairly as possible. This involves judging what standards are acceptable to the workers and considered right by them. In making these guesses mistakes may be made and they show up, after the event, by the workers' reactions to the time-studied production standards. The workers may find that the standards of effort which are implied in the time-studied production standards for the job are higher than their habitual standards of effort and that they cannot make normal earnings with what they consider the right standard of effort; the result is complaints about tight rates and demands that the job be restudied, usually followed by an adjustment of the standard. Conversely, standards may be set too low, making it possible for the workers to get exceptionally high earnings with their habitual standard of effort; as a result management is faced with loose rates. In practice, setting production standards and piece-rate prices is a question of getting agreement between both sides as to what is the ' right ' standard and the ' right ' price for it. Close examination reveals[28] that agreement on correct rates and standards is arrived at by a process of bargaining which involves the adjustment of standards to each other. Many firms develop established procedures for setting standards and rates which fit into the agreed pattern. For instance, there may exist provisions for the adoption of provisional rates for new jobs. If these rates turn out to be tight, workers can obtain adjustments; if they prove acceptable they become established.

If no procedures exist for arriving at agreement, and if tight rates are not adjusted, they may give rise to restriction of output. In such a situation, if there is no confidence in management, loose rates, too, have been found to result in restriction of output. As mentioned earlier, Roy[29] found that workers on jobs where the rates were tight (i.e. on ' stinkers ') decided it was not worth putting in any effort and

[26] See H. Behrend, op. cit.
[27] This is dealt with by the so-called rating or levelling methods.
[28] See H. Behrend, op. cit.
[29] See D. Roy, op. cit.

let their standards drop to a minimum. On jobs where the rates were loose (i.e. on 'gravy' jobs) the workers set an upper limit to their effort for fear of rate-cutting.[30] The evidence which we have on the operation of financial incentives suggests that, in practice, there is one 'right' production standard for each effort-bargain, that is one standard for each job which is acceptable at any given point of time and which works. The standard which is right because it works for a given job in one factory may be wrong in another, for different factories have among other things different traditions of speed and of human relations. As Ryan[31] points out, a completely arbitrary standard may not work; it might be above everybody's achievement. Standards must bear some relation to the actual production rates of a factory. They must represent the actual expected average rate of performance. What matters from management's point of view is the setting of acceptable (and accepted) standards which are as high as possible and fair, relative to each other within the factory.

This raises the question as to what is the relation of the standard that works (that is, the standard agreed in individual factories) to the ideal of a fair day's work? Does work-measurement not aim to set up absolutely valid standards? It seems to me that on this issue work-measurement is caught in the same paradox that was pointed out earlier: that two conceptions are current side by side; the ideal of absolutely valid production standards as well as the more practical ideal of relatively valid standards.[32]

Recent research has drawn attention to the inconsistency of different time-study officers in setting production standards.[33] This inconsistency is serious if one believes that the aim of work-measurement is to establish generally valid standards of performance. In practice, however, work-measurement is usually only concerned with

[30] On this point compare also Roethlisberger and Dickson, op. cit., Ch. 18.

[31] T. A. Ryan, op. cit. Compare also A. Abruzzi, *Work, Workers and Work Measurement* (Columbia University Press, 1956), pp. 24 ff., and J. Montague, op. cit., p. 173.

[32] Compare Ryan, op cit., p. 45. Ryan considers that there exist two goals under payment by results: the '*goal of relative validity* or accuracy of the standards' which means that 'standards for various jobs should be fair in relation to each other', and a second goal, namely that of 'absolute validity or accuracy; that is, the absolute level of effort required at the standard pace should be fair to all concerned. This goal has also sometimes been called the "fair day's work"'.

[33] See, for instance, L. Cohen and L. Strauss, 'Time Study and the Fundamental Nature of Skill', *Journal of Consulting Psychology*, Vol. 10, 1946, pp. 146 ff. Winston Rodgers and J. M. Hammersley, 'The Consistency of Stop-Watch Time-Study Practitioners', *Occupational Psychology*, Vol. 28, No. 2, April 1954. R. Marriott, *Incentive Payment Systems: A Review of Research and Opinion* (Staples Press, 1957), pp. 95-98.

establishing standards that are valid in one plant, and within the plant the internal bargaining process is the final arbiter of standards.

## VII. Implications for Collective Bargaining

However informal this internal bargaining process may be, its importance cannot be overstressed. Nor must its implications be overlooked.

The setting, maintenance and adjustment of effort-standards which take place continuously at shop-floor level and which are so often linked to the setting of payment by results rates represent a process of bargaining which goes on side by side with national collective bargaining. Thus there takes place a duplication of the bargaining process. Certain issues are bargained about twice. Sometimes, for instance, national agreements attempt to deal with the problem of effort-standards and restrictive practices. Thus, in 1957, in the dispute in the engineering industry the Engineering and Allied Employers' Federation attempted to deal with restrictive practices by national bargaining; it introduced the issue into wage-negotiations and in the agreement which was eventually reached the Confederation of Shipbuilding and Engineering Unions agreed among other things 'to use their full influence to bring to an end without delay all practices which are contrary to the well-being of the industry, including, for example—(1) Unconstitutional stoppages of work. (2) Embargoes on overtime. (3) All restrictions on output or earnings.[34]

It can be argued that this type of national agreement is too vague and remote from the shop-floor to be effective; only in special cases where identical equipment is used as in the knitting of nylon stockings is it possible to conclude a meaningful and comparatively unambiguous industry-wide collective bargain about standards of output. In most cases, the obstacles to the national determination of fair production standards are formidable. Therefore, most effort-bargaining must of necessity take place within the firm. As Professor Phelps Brown writes: '. . . it has happened more than once recently that the employers have asked for a reduction of "restrictive practices" in return for a wage rise; but with the best will in the world the union leaders at those bargaining tables could not commit their members up and down the country to particular changes in working practices whose significance could be evaluated only on the spot.'[35]

[34] For particulars of the agreement see *Ministry of Labour Gazette*, June 1957, p. 199.

[35] E. H. Phelps Brown, 'The Importance of Works Agreements', *Personnel Management*, March 1960, p. 6.

On the spot evaluation, as has been shown in this paper, arises all the time on the shop-floor, and one can say that bargaining about standards of production is part of the everyday life of the plant. Even on the shop-floor, however, the adjustment of manager and worker conceptions of effort standards is not an easy process, but usually it is a manageable process. Moreover, it is not likely that it can be eliminated by national bargaining.[36] This fact strengthens the case of the advocates of plant-bargaining, especially because bargaining about effort is frequently not independent from bargaining about wages.

If there is a case for plant-bargaining (and this is not the only argument put forward in its favour[37]), this in turn has important implications for trade union structure. For, as long as the trade union branch is based on place of residence rather than place of work, there exists an important obstacle to plant-bargaining. A structure in which the trade union branch is based on the place of work avoids the need for two types of union official (branch officers and shop stewards), and thus eliminates the difficulties that can arise from this type of duplication of officials. Under the present structure, the existence of in-plant bargaining increases the power of in-plant leaders and this can seriously undermine trade union authority as illustrated by many an unofficial strike.

To meet this situation the place of the shop-steward in the trade union structure needs to be reconsidered and his bargaining powers defined and formalised.

## VIII. Conclusions

This paper set out to examine how far it is possible to envisage, define and measure a fair day's work. It showed that the employment contract lacks precision and thus does not define a day's work clearly. The notion of a fair day's work introduces normative pressures which act as a guide to conduct in this ambiguous situation.

The concept of an amount of work which is right and which ought to be performed—of a fair and honest day's work—is, however, vague.

[36] Compare Phelps Brown, op. cit., p. 5: 'The industry-wide agreement can deal only with situations that are common to many firms, and in a varied industry the highest common factors are not very high. Much that concerns the particular worker in his particular job has to be left out of the scope of organised bargaining altogether unless that is established within the firm as well as at the national level.'

[37] See Phelps Brown, op. cit., D. J. Robertson, 'The Inadequacy of Recent Wage Policies in Britain', *Scottish Journal of Political Economy*, Vol. V, No. 2, June 1958, and D. J. Robertson, *Factory Wage Structure and National Agreements* (Cambridge University Press, 1960).

It is abstract and difficult to translate into concrete terms. It is the expression of internalised value systems, and stimulates guilt feelings when a bad conscience is activated. Thus it is an ethical concept, and its definition depends on value judgments, not on facts. It follows that it is not possible to measure or ascertain scientifically how much work represents a fair day's work.

The essential point to grasp is that factory production standards are considered fair *not* because they are based on work measurement but because they are judged and accepted as fair by all the parties concerned. It is the mutual agreement between management and workers which matters and which determines what production standards are accepted as right and are adopted. Work measurement is merely a tool for reaching such agreement, not a substitute for it.

Agreement is reached through bargaining about what represents a fair day's work. Such bargaining takes place continuously within the plant, and it is not likely that it can be eliminated. This raises the question of the wisdom of the duplication of the bargaining process that takes place when most formal collective bargaining is conducted nationally. It also raises the question what is the most appropriate trade union structure in this situation.

In practice, it seems, the concept of a fair day's work acts as a dynamic regulative force round which management and workers bargain about working hours, production standards and wages.

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# MR. SRAFFA'S REHABILITATION OF CLASSICAL ECONOMICS[1]

## I

Mr. Sraffa's important new book, *Production of Commodities by Means of Commodities*,[2] is described in the publisher's blurb as 'a work of a specialist character, addressed to those interested in pure economic theory'. One should not be intimidated by this, however: the book is a short one, running to less than 100 pages; the argument is on the whole quite lucid; and the mathematics used is of a very elementary character. Nevertheless, the problems with which the book deals are from their very nature rather complex and abstract; and some of Sraffa's analytical tools and methods are likely to appear strange to those unversed in the ways of Ricardo and Marx. The present article is an attempt to summarise Sraffa's main argument and to state in simple language just what I think he is getting at.

The book can be looked at from various points of view. It can be regarded, if one pleases, simply as an unorthodox theoretical model of a particular type of economy, designed to solve the traditional problem of value in a new way—in which case it will be judged purely on its own merits. Or it can be regarded as an implicit attack on modern marginal analysis: the sub-title of the book is 'Prelude to a Critique of Economic Theory', and Sraffa in his preface expresses the hope that someone will eventually attempt the job of basing a critique of the marginal analysis on his foundations. Or, finally, the book can be regarded as a sort of magnificent rehabilitation of the classical approach to certain crucial problems relating to value and distribution. It is upon this third aspect of the book that I am concentrating in the present article. In doing so, I do not of course want to suggest that the *essence* of Sraffa's book lies in this rehabilitation of the classical approach: Sraffa's primary aim is not to show that there's life in the old dogs yet, but to build a 20th-century model to deal with 20th-century problems. I am approaching his book in

[1] This article is based on a lecture given at the University College of North Wales, Bangor, on 21 November 1960. It owes much to the criticisms of Mr. Maurice Dobb and Mr. John Eaton, who must not, however, be held responsible for any errors which remain.

[2] Cambridge University Press, 1960. 12s. 6d.

this particular way simply because I think it affords the best method of understanding Sraffa's basic argument.

Let me begin by making three general points about the relation between Sraffa's model and the old classical models. First, both Sraffa's model and the classical models are concerned with the investigation of one and the same set of properties of an economic system—those properties, as Sraffa puts it, which 'do not depend on changes in the scale of production or in the proportions of "factors"'.[3] The classical people, at any rate in their basic analysis of the economy as such, were usually *in effect* concerned with these properties alone, since they often tended to assume that under given technological conditions returns to scale for the industry as a whole would be constant,[4] and that the proportions in which the different means of production were used in an industry would be technically fixed. Sraffa, by way of distinction, makes no assumption whatever about the variability or constancy of returns. Rather, he simply selects for analysis a particular kind of economic system in which the question of whether returns are variable or constant is irrelevant. This system is one in which production goes on from day to day and from year to year in exactly the same way, without any changes in scale or 'factor' proportions at all. By this means Sraffa is able *deliberately* to concern himself with the investigation of the same properties of an economic system which the classical people *objectively* concerned themselves with, while at the same time avoiding the necessity of making any (possibly objectionable) assumptions about the nature of returns.

The second point is this: The classical people, anxious as they were to propound generalised statements or 'laws' relating to the economy in which they were interested, naturally wanted to make their systems 'determinate' in some useful and meaningful sense of that word. The methods they employed to secure the requisite degree of determinacy were often ingenious and stimulating. But they did not hit on the idea that it would help greatly to secure determinacy if certain specific interrelations were postulated between elements of input and elements of output over the economy as a whole, so that the output of certain industries was assumed to constitute the input of others. They were of course aware that such interrelations did exist and were important: Quesnay, after all, framed his *Tableau Economique;* Marx worked out his famous reproduction schemes; and

[3] Sraffa, p. v.

[4] I.e., roughly, that a change in the size of an industry would not alter the unit cost of producing the commodity concerned.

Ricardo (if Sraffa is right) held at one stage a 'corn-ratio theory of profits'.[5] The point I am making is simply that they did not, by and large, use these postulated interrelationships as an integral part of the methods which they employed to make prices and 'factor' incomes determinate—i.e., to solve the general problem of value. And this is precisely what Sraffa *does* do.[6]

The third point is this: The classical people were primarily interested in the problem of the *development* of the capitalist system, but they believed that a necessary preliminary to the study of this problem was an analysis of *the nature of the capitalist system as such.* And the best method of going about this analysis, they believed, was to begin by imagining capitalism suddenly impinging upon a pre-capitalist form of economy in which, in effect, labour was the only 'factor' receiving a reward. In this pre-capitalist economy, which Smith called the 'early and rude state of society' and Marx called 'simple commodity production', the whole produce of labour went to the labourers.[7] In such an economy, it was claimed, the relative equilibrium prices of commodities would tend to be equal to the relative quantities of labour required from first to last to produce them. What happened, then, when a class of capitalists arrived on the scene, and the net product of the economy consequently came to be shared between labourers and capitalists? In particular, what happened to relative equilibrium prices? Did they remain equal to relative quantities of embodied labour, or did they now diverge from these quantities? If they diverged, were the divergences haphazard, or could they be shown to be in some useful sense 'subject to law'? Did the divergences render it necessary to throw out the simple 'law of value' which used to operate in the pre-capitalist economy, or could they be regarded as merely *modifying* its operation? These questions were not regarded as purely academic ones, with little relevance to problems of practical policy. On the contrary, the classical people believed that if one could give adequate answers to them one would then have penetrated to the very essence of the capitalist system, and would be properly equipped to proceed to the major task—that of the determination of what Marx (and Mill) called the 'laws of motion' of the capitalist system. The general procedure which Sraffa adopts, and the questions he asks, are very similar to those I have just described.

[5] Sraffa, p. 93.

[6] The specialist will notice the intellectual affinity between Sraffa's approach and that of the Walrasian-type analysis and modern 'input-output' techniques.

[7] Cf. Adam Smith, *Wealth of Nations* (Cannan edn.), Vol. I, pp. 49 and 66.

## II

Sraffa begins with a very simple model of a subsistence economy in which there are only two commodities produced—wheat and iron—and in which the total amount of each of these commodities which goes into the productive process each year is precisely the same as the total amount which comes out.[8] A possible set of conditions of production in such an economy is as follows:

$$\begin{array}{rcl} 280 \text{ qr. wheat} + 12 \text{ t. iron} & \rightarrow & 400 \text{ qr. wheat} \\ 120 \text{ qr. wheat} + 8 \text{ t. iron} & \rightarrow & 20 \text{ t. iron} \\ \hline 400 & & 20 \end{array}$$

In the wheat industry (represented by the first line) 280 quarters of wheat and 12 tons of iron are used up during the year in order to produce an annual output of 400 quarters of wheat. In the iron industry (represented by the second line) 120 quarters of wheat and 8 tons of iron are used up during the year in order to produce an annual output of 20 tons of iron.[9] It will be seen that a total of 400 quarters of wheat and 20 tons of iron goes into the productive process and is used up there, and that 400 quarters of wheat and 20 tons of iron come out of the productive process at the end of the year.

Now, at the end of each year the wheat producers are going to have 400 quarters of wheat in their hands, 280 quarters of which have to be earmarked for the following year's input. If the process of production is to continue from year to year at the same level, it is clear that the proceeds from the sale of the remaining 120 quarters of wheat must be sufficient to enable the wheat producers to buy the 12 tons of iron which they will need as input in the following year. Similarly, the iron producers are going to have 20 tons of iron in their hands, 8 tons of which have to be earmarked for the following year's input. If the process of production is to continue from year to year at the same level, it is clear that the proceeds from the sale of the remaining 12 tons of iron must be sufficient to enable the iron producers to buy the 120 quarters of wheat which they will need as input in the following year. It is evident, therefore, that prices in this economy must be such that 12 tons of iron are exchangeable on the market for 120 quarters of wheat—i.e., that the price of a ton of iron must be ten times the price of a quarter of wheat. This analysis can readily be generalised to cover the case of a more complex subsistence economy

[8] Sraffa, pp. 3-5.

[9] We assume for the moment that subsistence goods for the labourers are included in the wheat and iron inputs.

in which any number $k$ of different commodities is produced. A set of $k$ production equations in price terms can be drawn up in which the number of independent equations is equal to the number of unknowns, so that the prices of all the commodities produced become determinate.[10]

Let us now drop the assumption of a subsistence economy, and turn, as Sraffa does,[11] to the case of an economy in which a surplus over subsistence is yielded. Such an economy might be one with the following conditions of production:

| | |
|---|---|
| 280 qr. wheat + 12 t. iron → | 575 qr. wheat |
| 120 qr. wheat + 8 t. iron → | 20 t. iron |
| 400 | 20 |

It will be seen that this economy is the same as the previous one except that the wheat industry is now assumed to produce 575 quarters of wheat every year instead of 400. If we assume that the rewards going to labour are fully taken care of in the wheat and iron inputs of the two industries, as we have so far been doing,[12] this means that the whole value of the surplus of 175 quarters of wheat will be available for distribution in the form of profit. Let us assume that this profit is distributed in such a way as to make the *rate* of profits equal in both industries—in other words, that the owners of each industry earn what the classical economists called the 'normal' or 'average' rate of profits on their advances. The situation now is that prices must be such as to allow the elements of input in each industry to be replaced, *and* to allow profits on the value of these elements of input to be earned at the same rate in each industry. In the present example, these two conditions will be fulfilled if prices are such as to make 1 ton of iron exchangeable on the market for 15 quarters of wheat, which will bring the average rate of profits out at 25 per cent.[13] Once again this analysis can readily be generalised to cover the case of a more complex economy in which any number $k$ of different commodities is

[10] Specialists will appreciate that any one of the $k$ equations can be inferred from the sum of the others, so that there are in fact only $k-1$ *independent* equations. But it is easy to reduce the number of unknowns to $k-1$ by taking one commodity as the standard of value and making its price equal to unity. See Sraffa, p. 5.

[11] Sraffa, pp. 6 ff.

[12] See n. 9.

[13] Let the price of a quarter of wheat be 1; let the price of a ton of iron be $p_i$; and let the average rate of profits be $r$. The production equations in price terms will then read as follows:

$$(280+12.p_i)(1+r)=575$$
$$(120+8.p_i)(1+r)=20.p_i$$

These equations yield the solutions $p_i=15$ and $r=\frac{1}{4}$.

produced. A set of $k$ production equations in price terms can be drawn up in which the number of independent equations is equal to the number of unknowns, so that the prices of the $k$ commodities, *and* the average rate of profits, are all determined.[14]

We must now alter the assumption we have so far been making about wages. Up to this point we have in effect assumed that wages consist of necessary means of subsistence for the workers, and thus, as Sraffa puts it, enter the system ' on the same footing as the fuel for the engines or the feed for the cattle '.[15] But wages may in fact include not only the ' ever-present element of subsistence ' (which is constant), but also a ' share of the surplus product ' (which is variable).[16] What is one to do about this? The most appropriate thing to do would be to separate the wage into its two component parts, continuing to treat the goods required for the subsistence of the workers as means of production along with the fuel, fodder, etc., and treating the variable element in the wage as a part of the surplus product of the system. Sraffa, however, in order to avoid ' tampering with the traditional wage concept ', from now on treats the whole of the wage as variable—i.e., as part of the surplus product. This means that the quantity of labour employed in each industry has from now on to be represented explicitly in our statements of the conditions of production, taking the place of the corresponding quantities of subsistence goods in our previous statements.

When the wage is recognised as containing a variable element, or when, as with Sraffa, the whole of the wage is assumed to be variable, we have another unknown to be added to our list. In a system where $k$ commodities are produced, we now have $k+2$ unknowns—the $k$ prices, the rate of profits $r$, and the wage $w$.[17] And the best we can do, when we put the production equations in price terms, is to provide $k+1$ equations in order to find these $k+2$ unknowns. Thus the system is not determinate, unless one of the variables can be taken as fixed.[18]

[14] There are $k$ independent equations, which, if one commodity is taken as the standard of value and its price made equal to unity, are sufficient to determine the $k-1$ prices and the rate of profits $r$.

[15] Sraffa, p. 9.

[16] This implies that Sraffa is defining the ' surplus product ' of a system as the difference between gross output and what Ricardo called ' the absolutely necessary expenses of production.'

[17] ' We suppose labour to be uniform in quality or, what amounts to the same thing, we assume any differences in quality to have been previously reduced to equivalent differences in quantity so that each unit of labour receives the same wage ' (Sraffa, p. 10).

[18] Let A be the quantity annually produced of commodity ' a '; let B be the quantity annually produced of commodity ' b '; and so on. Let $A_a$, $B_a$, . . . , $K_a$ be the quantities of commodities ' a ', ' b ', . . . , ' k ' annually used as means of production by the industry which produces A; let $A_b$, $B_b$, . . . ,

As Sraffa puts it, 'the system can move with one degree of freedom; and if one of the variables is fixed the others will be fixed too'.[19] In particular, if we know what the wage is, the rate of profits and all the prices will be determined.

## III

Having erected this simple model, Sraffa now proceeds to investigate what we have seen to be the basic classical problem—what happens to prices and profits when a class of capitalists arrives on the scene to share the net product of the economy with labour? Sraffa deals with this problem by giving the wage successive values ranging from 1 to 0 —a wage of 1 representing a situation in which *all* the net product goes to labour (i.e., there is no class of capitalists and therefore no profit), and a wage of 0 representing the other extreme in which *none* of the net product goes to labour (i.e., there is a class of capitalists which manages to secure *all* the net product in the form of profit). The main task is to show what happens to prices and to the rate of profits as the wage is reduced from 1 to 0.

When the wage is 1—i.e., when the whole of the net product goes to wages—we in effect revert to the simple set of equations with which we started, except that (as already stated) the quantities of labour employed in each industry will now be shown explicitly in our equations instead of being represented, as they were before, by quantities of subsistence goods. It is easy to show that in this situation the equilibrium prices of the different products will be proportionate to the different quantities of labour which have been directly and indirectly employed to produce them. For if the only form of income is wages,

$K_b$ be the quantities of commodities 'a', 'b', . . . , 'k' annually used as means of production by the industry which produces B; and so on. Let $L_a, L_b, \ldots, L_k$ be the quantities of labour annually employed in the industries producing A, B, . . . , K. These quantities are the 'knowns' in our equational system.

Let $p_a, p_b, \ldots, p_k$ be the unit prices of commodities 'a', 'b', . . . , 'k'. Let $r$ be the average rate of profits. Let $w$ be the wage per man. These quantities are the 'unknowns' in our equational system.

In generalised form, the production equations in price terms will read as follows:

$$(A_a.p_a + B_a.p_b + \ldots + K_a.p_k)(1+r) + L_a.w = A.p_a$$
$$(A_b.p_a + B_b.p_b + \ldots + K_b.p_k)(1+r) + L_b.w = B.p_b$$
$$\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$$
$$(A_k.p_a + B_k.p_b + \ldots + K_k.p_k)(1+r) + L_k.w = K.p_k$$

By putting the surplus product of the system equal to unity (thereby making it the standard in terms of which the wage and the $k$ prices are expressed) we obtain an additional equation, making a total of $k+1$ equations. But there are $k+2$ unknowns, so that the system is not determinate unless one of the variables (e.g. the wage $w$) can be taken as fixed. (See Sraffa, pp. 4, 6 and 10-11.)

[19] Sraffa, p. 11.

all input-costs ultimately reduce to wage-costs. This means that the value of each end-product will be equal to the sum of its inputs at wage-cost, which of course implies (if wages are uniform) that price ratios will be equal to embodied labour ratios.[20] What this proposition amounts to, of course, is an affirmation of the truth of the Smithian, Ricardian and Marxian proposition that in the 'early and rude state of society', where there is no profit, the classical 'law of value' acts, as it were, directly, so that price ratios will in equilibrium be equal to embodied labour ratios.

Now, Smith, Ricardo and Marx, having established this proposition, went on to argue that in a capitalist society, where the net product was shared between wages and profits, prices no longer followed this simple rule. The 'law of value' which originally operated in this direct and simple way was now subject, as Ricardo put it, to important 'modifications'.[21] Sraffa, like his classical predecessors, now goes on to consider the nature and causes of these 'modifications'.

Sraffa's explanation of the basic reason for the emergence of the 'modifications' is substantially the same as that of Ricardo and Marx. 'The key to the movement of relative prices consequent upon a change in the wage', Sraffa writes, 'lies in the inequality of the proportions in which labour and means of production are employed in different industries'.[22] It is useful, I think, to begin by explaining this point in Ricardo's terms. Let us assume that we have an economy which consists of three separate industries, A, B and C, in each of which the proportions in which labour and means of production are combined together are different. In other words, the ratio of the wage-

[20] Suppose that a two-industry economy produces a gross output of 400 quarters of wheat and 25 tons of iron. Let the sum of the inputs at wage-cost in the two industries be £200 and £250 respectively. Since the value of the end-product will in each case equal the sum of its inputs at wage-cost, the price of a ton of iron will be 20 times the price of a quarter of wheat. Let the wage per man be £5. This means that 40 units of direct and indirect labour are required to produce 400 quarters of wheat, and 50 units of direct and indirect labour are required to produce 25 tons of iron. Thus 20 times as much labour is required to produce a ton of iron as is required to produce a quarter of wheat. Thus price ratios are equal to embodied labour ratios.

[21] Smith, broadly speaking, believed that the 'modifications' were so important as to render it necessary to throw out the old 'law of value' and to replace it by what amounted to a 'cost-of-production' theory of value. Ricardo agreed that the 'modifications' were important, but argued that it was still possible to say that relative prices were *mainly* determined by relative quantities of embodied labour (and, what was for him more significant, that *changes* in relative prices were mainly caused by *changes* in relative quantities of embodied labour). Marx also emphasised the importance of the 'modifications', but maintained that the old 'law of value' still *ultimately* and *indirectly* determined prices. Sraffa, as will be shown in the last part of this article, in effect follows Marx's line of approach to this problem.

[22] Sraffa, p. 12.

bill to the value of used-up means of production is different in each industry. Such an economy might be the following:

| | *Value of Used-up Means of Production* | | *Wages* | | *Price* |
|---|---|---|---|---|---|
| A. | 800 | + | 200 | = | 1000 |
| B. | 600 | + | 400 | = | 1000 |
| C. | 200 | + | 800 | = | 1000 |

Wages, we begin by assuming, absorb the whole of the net product, profits being zero. Under these circumstances, the price of the finished product will in each case be 1000, as indicated in the table.

Now, suppose that a class of capitalists arrives on the scene and shares in the net product along with labour. Wages, let us assume, go down by one-half, and as a result of this profits rise from zero to a level which affords an average rate of, let us say, 25 per cent. on the value of the means of production. (We leave aside for the moment the important question of how far profits will *in fact* rise as a result of this particular wage-reduction: we simply assume that they will rise from zero to an arbitrarily-chosen figure of 25 per cent.) The price of each commodity will now be made up of the value of the means of production employed (which we assume for the moment to remain at its original level), plus the wage-bill (now cut by one-half in each case), plus profit at 25 per cent. on the value of the means of production. The situation will then be as follows:

| | *Value of Used-up Means of Production* | | *Wages* | | *Profits* | | *Price* |
|---|---|---|---|---|---|---|---|
| A. | 800 | + | 100 | + | 200 | = | 1100 |
| B. | 600 | + | 200 | + | 150 | = | 950 |
| C. | 200 | + | 400 | + | 50 | = | 650 |

It is clear that under these circumstances the prices of the three commodities would have to change from their original levels. If the price of the product of industry A remained at 1000, that industry would show a sort of 'deficit': it would not be able to pay wages at the given rate and at the same time receive profits at the given rate on its means of production. Similarly, if the prices of the products of industries B and C remained at 1000, these industries would show a sort of 'surplus': they would secure receipts which were more than sufficient to pay wages at the given rate and to earn profits at the given rate on their means of production. Therefore prices would clearly have to alter to the levels indicated in the second table above. The relative prices of the three commodities would change in this case, when the wage changed, simply because the proportions in which

labour and the means of production are combined in the three industries are different. If these proportions were the same in each case, it is easy to show that relative prices would not change at all from their previous level.[23]

Now, it *looks* from this example as if we could frame a simple general rule about what happens to prices when wages fall. Could we not say that the price of the product of an industry with a relatively low proportion of labour to means of production, like industry A in our example, would rise when wages fell; and that the price of the product of an industry with a relatively high proportion of labour to means of production, like industries B and C in our example, would fall when wages fell? This is in effect what Ricardo said. But this need not in fact necessarily be so. It certainly *looks* from our example as if the price of the product of industry B, say, is bound to fall. But we have so far assumed, as Ricardo usually did, that the value of the means of production employed in industry B remains the same as it was initially—i.e., at 600—in spite of the fall in wages. But suppose that these means of production employed in industry B were themselves produced by an industry like A in our example, where the proportion of labour to means of production is relatively low. The price of the means of production employed in B would then rise when wages fell, so that the price of the *product* of industry B, instead of falling as it does in our example, might actually rise. Thus the movements in the relative prices of any two products, consequent upon a change in wages, come to depend, as Sraffa puts it, 'not only on the "proportions" of labour to means of production by which they are respectively produced, but also on the "proportions" by which those means have themselves been produced, and also on the "proportions" by which the means of production of those means of production have been produced, and so on'.[24]

Now, we could imagine that an industry existed which represented a sort of 'borderline' between the 'deficit' and 'surplus' industries which we have just distinguished. In such an industry, as Sraffa puts it, 'the proceeds of the wage-reduction would provide exactly what was required for the payment of profits at the general rate'.[25]

[23] Take, for example, a situation in which industry A uses up 400 means of production and pays out 800 in wages; industry B uses up 300 means of production and pays out 600 in wages; and industry C uses up 200 means of production and pays out 400 in wages. The prices of the three products in the initial situation will be 1200, 900 and 600—i.e., they will stand to one another in the ratio 4:3:2. If wages fall by one-half and profits as a result rise from zero to 25 per cent., the prices of the products will become 900, 675 and 450 respectively—i.e., they will still stand to one another in the ratio 4:3:2.

[24] Sraffa, p. 15.

[25] Sraffa, p. 13.

Suppose, for example, that there was an industry which employed labour and means of production in such a proportion that on the basis of the initial prices of the means of production the proceeds of the wage-reduction provided exactly the amount that was required to pay profits at the average rate—instead of something less, as in our industry A, or something more, as in our industries B and C. Suppose further—and this is the vital point—that the means of production which this industry employed were themselves produced by labour and means of production in the same proportion, and so on right down the line. There would be nothing in the conditions of production of such an industry which would make its product rise or fall in value relative to any other commodity when wages rose or fell. And the value of such a commodity relative to the value of its own means of production could not possibly change, since the same 'proportions' would by hypothesis apply in the case of these means of production, *their* means of production, and so on right down the line. Thus one way of expressing the quality of 'invariance' which the product of this borderline industry would possess is to say that the ratio of the value of the industry's net product to the value of its means of production would always remain the same whatever change took place in the wage. And it is easy to show that this ratio must be equal to the average rate of profits which would prevail over the economy as a whole if wages were zero[26]—the 'maximum rate of profits', as Sraffa calls it. Sraffa uses the term 'R' to refer both to the ratio of the value of the net product of the borderline industry to the value of its means of production, and to the 'maximum rate of profits'. So we have:

$$\frac{\text{Value of net product of borderline industry}}{\text{Value of its means of production}} = \text{'Maximum rate of profits'} = R$$

Having set out in a general way the basic condition of an 'invariant' industry, Sraffa now proceeds to ask whether an industry fulfilling this condition could in fact be found. No actual industry in the economy is likely to fulfil the requirements; but, Sraffa argues, a mixture of industries, or of bits of industries, would do just as well. His next task, therefore, is to show that it is in fact possible to distil, from any actual economy, a sort of composite industry in which the

[26] If the wage fell to zero, the ratio of the value of the net product of the borderline industry to the value of its means of production would become equivalent to the rate of profits in the borderline industry, and by hypothesis this ratio cannot change. Thus if wages are zero, prices in the rest of the economy must so change as to bring the average rate of profit into equality with the ratio of the value of the net product of the borderline industry to the value of its means of production.

ratio of net product to means of production will remain invariable in the face of any change in the wage. Let us take a simple example of the distillation operation which Sraffa undertakes in order to obtain a composite industry which fulfils this basic condition. Take the economy whose conditions of production in physical terms are as follows:

375 qr. wheat + 6 t. iron → 750 qr. wheat
300 qr. wheat + 24 t. iron → 40 t. iron

675 30

The net product of this economy consists of 10 tons of iron plus 75 quarters of wheat. Now, suppose that we separate off *two-thirds* of the wheat industry and *one-half* of the iron industry, and treat the two resultant fractions of these industries as constituting together a sort of composite industry.[27] The conditions of production of this composite industry would be as follows:

250 qr. wheat + 4 t. iron → 500 qr. wheat
150 qr. wheat + 12 t. iron → 20 t. iron

400 16

Let us now identify the crucial ratio of net product to means of production in this composite industry. The net product consists of 4 tons of iron plus 100 quarters of wheat; and the means of production consist of 16 tons of iron plus 400 quarters of wheat. Thus the ratio is:

$$\frac{4 \text{ t. iron} + 100 \text{ qr. wheat}}{16 \text{ t. iron} + 400 \text{ qr. wheat}}$$

The numerator and denominator of this ratio, it will be noticed, are made up of quantities of the same commodities combined in the same proportions, which means that we can speak of a ratio between the two sets of commodities without the need to reduce them to the common measure of price. The ratio is of course one-quarter. And it is clear that this ratio would remain the same whatever the *prices* of the two commodities happened to be. The ratio between the two sets of commodities in *price* terms would always be the same as it is in *physical* terms—one-quarter. In other words, even though wages altered and prices subsequently changed, the ratio of the value of the net product of this composite or 'standard' industry to the value of

[27] We leave aside for the moment the question of how the appropriate multiplying fractions are arrived at.

its means of production would necessarily remain unchanged. Thus this industry would fulfil the basic condition of invariance which we have already established.

By what subtle magic has this rather startling result been obtained? We have obtained it because the fractions which we selected as our multipliers were cunningly chosen so that in the reduced-scale system the proportions in which the two commodities are produced (20 : 500) are the same as those in which they enter the aggregate means of production (16 : 400). It is only because the multiplying fractions which we chose were such as to yield us a reduced-scale system possessing this particular property that the numerator and denominator of the ratio of net product to means of production have come to consist of quantities of the same commodities combined in the same proportions, so that the ratio necessarily remains invariant to price changes. Sraffa now proceeds to show very elegantly that there is always a set of multipliers, and never more than one set, which when applied to the industries of any actual economy will rearrange them in the 'right' proportions.

Let us now consider what happens to the rate of profits *in the composite or 'standard' industry* when the wage changes. If we write R (as before) for the ratio of net product to means of production, $r$ for the rate of profits, and $w$ for the proportion of the net product going to wages, the relation between wages and profits in the 'standard' industry can be expressed in the form of the following simple relation:

$$r=R(1-w)$$

Take as an example the 'standard' industry which we have just considered, where $R=\frac{1}{4}$. Suppose that three-quarters of the net product (i.e., 3 t. iron+75 qr. wheat) went to wages, so that the remaining one-quarter (i.e., 1 t. iron+25 qr. wheat) went to profits. The rate of profits would then be:

$$\frac{1 \text{ t. iron} + 25 \text{ qr. wheat}}{16 \text{ t. iron} + 400 \text{ qr. wheat}} \quad (=1/16)$$

And this rate of profits of 1/16, or $6\frac{1}{4}$ per cent., is clearly given by the expression $r=R(1-w)$, where $R=\frac{1}{4}$ and $w=\frac{3}{4}$. What this expression says, in essence, is that the rate of profits *in the 'standard' industry* increases in direct proportion to the total deduction made from the wage, the extent of the increase depending on the value of R.

Now comes the final stage in this highly ingenious and persuasive argument. Sraffa maintains that this relation between wages and profits is not limited to our imaginary 'standard' system, but can also

be extended to the actual economic system from which the 'standard' system has been derived. For the actual system, Sraffa argues, consists of the same basic equations as the 'standard' system, only in different proportions, so that 'once the wage is given, the rate of profits is determined for both systems regardless of the proportions of the equations in either of them'.[28] Thus, Sraffa concludes, the rate of profits *over the economy as a whole* is determined as soon as we know R (the ratio of net product to means of production in the 'standard' industry, which is equal to the 'maximum rate of profits'), and $w$ (the proportion of the net product of the 'standard' industry going to wages). Or, to put the point in another way, when the proportion of the net product of the 'standard' industry going to wages is given, the average rate of profits over the economy as a whole depends upon the level of R.

In the remainder of his book, Sraffa makes extensive use of this simple relation between wages and profits to elucidate a number of difficult theoretical problems. In one chapter, for example, he analyses the case where commodities are produced with means of production which were themselves produced at different periods in the past (and so on down the line), so that the profit element in the prices of these means of production is different, and asks how the relative values of the commodities will vary with changes in the rate of profits.[29] In the second part of his book, again, he deals with the new problems which arise when we take account of the fact of the existence of items of fixed capital which outlast one use and gradually depreciate in value during the course of their life. What generalisations can be made, he asks, on the basis of the theoretical foundations erected in the earlier part of the book, concerning the path followed by this depreciation? Finally, carrying on with the method of successive approximations in much the same way as his classical predecessors, he brings land into the picture, and erects a more complex system of equations in which, if wages are given, the prices of all commodities, the rate of profits, *and* the rents payable on different qualities of land, are all determined. To the historian of economic thought, one of the most interesting features of these extensions of the basic analysis is the number of old friends who are met with. For example, in the chapter on fixed capital Sraffa makes interesting use of the old classical device, first used by Torrens, of treating what is left of fixed

[28] Sraffa, p. 23.

[29] In this chapter, Sraffa deals with the problem of reducing 'constant capital' (to use Marx's terminology) to quantities of labour. He points out, in effect, that the reduction operation can in fact be performed, provided that the labour is *dated* labour, since the dating will affect the rate of profits and therefore the prices of the commodities concerned.

capital at the end of the year as a kind of joint product of the industry in which it is used. Of special importance in these later parts of the book are the distinction which is early established between 'basic' and 'non-basic' products,[30] and the general analysis of joint products.

## IV

One very important feature of Sraffa's analysis remains to be commented upon—his implied rehabilitation of the classical labour theory of value in something very like the form which it assumed in the hands of Marx. The Marxian labour theory of value does *not* say, as is vulgarly supposed, that the equilibrium prices of commodities are always proportionate to the quantities of labour required to produce them. It affirms, certainly, that this statement is true of an economy where 'the whole produce of labour belongs to the labourer'; but it agrees—indeed emphasises—that equilibrium prices do *not* normally follow this simple rule in a capitalist economy where part of the net product goes to profits. In a capitalist economy, it is demonstrated, relative prices normally deviate from relative quantities of embodied labour, for reasons which have been described earlier in the present article. Even in a capitalist economy, however, it is argued, the equilibrium prices of commodities can still be shown to be 'indirectly' and 'ultimately' determined by certain crucial ratios of quantities of embodied labour applicable to the economy as a whole. For the deviations of price ratios from embodied labour ratios, given the proportions in which labour and means of production are combined together in each industry, depend upon the level of the average rate of profits; and the level of the average rate of profits, it is claimed, depends in its turn upon the crucial ratios of quantities of embodied labour to which I have just referred. Thus if it can in fact be shown that the average rate of profits is determined by these

[30] A 'basic' product, roughly speaking, is one which enters (no matter whether directly or indirectly) into the production of *all* commodities, and a 'non-basic' product is one which does not. A 'luxury' product, for example, which is not used (whether as an instrument of production or as an article of subsistence) in the production of other products, is 'non-basic'. (See Sraffa, pp. 7-8.) The important feature of 'non-basic' products is that they 'have no part in the determination of the system', their rôle being 'purely passive'. In other words, 'the price of a non-basic product depends on the prices of its means of production, but these do not depend on it', whereas 'in the case of a basic product the prices of its means of production depend on its own price no less than the latter depends on them' (p. 9). Specialists in Marxist theory will note the relevance of this part of Sraffa's analysis to an important question which arose in the course of the debate on the so-called 'transformation problem'—the question (raised in particular by Bortkiewicz) as to whether the conditions of production of luxury goods enter into the determination of the rate of profits.

embodied labour ratios, we can reasonably conclude that the very deviations of equilibrium price ratios from embodied labour ratios are themselves determined by 'quantities of embodied labour'.

Marx's method of showing the dependence of the rate of profits on 'quantities of embodied labour' in this sense can be illustrated with the aid of the following simple model:

| | *Means of Production* | *Wages* | *Surplus Value* |
|---|---|---|---|
| A. | 40 | 160 | 80 |
| B. | 60 | 90 | 45 |
| C. | 120 | 80 | 40 |

We here assume that the economy consists of three separate industries, A, B and C. The quantities under the three headings 'Means of Production', 'Wages' and 'Surplus Value' are each reckoned in terms of hours of labour. Take industry A as an example. In industry A, the means of production used up during a given period of production are assumed to 'contain' or 'embody' a total of 40 hours of past labour. The total amount of present or direct labour expended in the industry during the period is assumed to be 240 hours—the sum of the figures 160 and 80 under the respective headings 'Wages' and 'Surplus Value'. It is assumed that in two-thirds of this total working time—i.e., 160 hours—the direct labourers are able to contribute just enough value to the product to cover their own wages. In the remaining 80 hours they contribute what Marx called 'surplus value', which he assumed to be the sole source of capitalist profit. The same interpretation is given to the figures for industries B and C, where, it will be noticed, the proportions in which labour and means of production are combined together are different from those in industry A. The ratio of surplus value to wages is assumed to be the same (in this case 1 : 2) in each industry.

The average rate of profits in this economy, Marx argued, can be found by taking the aggregate surplus value yielded over the economy as a whole (165) and redividing it among the three industries in proportion to the means of production employed in each. Or, to put the point in a way which is perhaps easier to understand, the average rate of profits will be determined by the ratio of aggregate surplus value to aggregate means of production. In this case it will clearly be three-quarters, or 75 per cent.[31] This ratio of aggregate

[31] Marx, in common with his classical predecessors, generally assumed that wages were 'advanced' out of capital. This meant that in working out the rate of profits he normally related surplus value to means of production

quantities of embodied labour, then, determines the average rate of profits, and thus the deviations of equilibrium price ratios from embodied labour ratios.

At first sight this analysis might seem to have little in common with Sraffa's. But suppose we go on to postulate, as Marx himself did, an industry in which the ratio of used-up means of production to wages is equal to the ratio of these quantities when they are aggregated over the economy as a whole. Industry B in our illustration is clearly an industry possessing this characteristic—it is an industry in which, to use Marx's terminology, the 'organic composition of capital' is equal to the 'social average'.[32] In such an industry, as can be seen from the illustration, the ratio of surplus value to means of production (45 : 60) is equal to the ratio of these quantities over the economy as a whole (165 : 220). We can thus say, as Marx did,[33] that the average rate of profits over the economy as a whole is determined by the ratio of surplus value to means of production *in this industry B*, whose conditions of production represent a sort of 'social average'. Or, to put the same proposition in another way, the average rate of profits over the economy as a whole is given by the following expression:[34]

$$\frac{\text{Labour embodied in net product of industry B}}{\text{Labour embodied in its means of production}} \left( 1 - \begin{array}{c}\text{proportion of net product of industry B going to wages}\end{array} \right)$$

Now, the similarity between this Marxian relation and that expressed in Sraffa's $r=R(1-w)$ is surely very striking. For, in the first place, let us note that Sraffa's R, although usually expressed as the ratio of the *value* of the net product of the 'standard' industry to the *value* of its means of production, is in fact equal to the ratio of the *labour embodied* in the net product of the 'standard' industry

*plus wages*. Following Sraffa's precedent (p. 10), I am assuming here that the wage is not in fact 'advanced', but 'paid *post factum* as a share of the annual product', which means that the rate of profits is obtained by relating surplus value to means of production alone. To drop this particular assumption of Marx's does not affect the essence of his analysis, and greatly facilitates the comparison with Sraffa which is made below.

[32] See *Capital*, Vol. III (Kerr edn.), p. 193. In the example, the 'organic composition of capital' in industry B (60 : 90) is clearly equal to the 'organic composition of capital' over the economy as a whole (220 : 330).

[33] *Capital*, Vol. III, p. 204.

[34] In this expression the 'net product' is taken to consist of wages plus surplus value (as, in effect, it is with Sraffa). Thus the expression is merely another way of formulating the ratio of surplus value to means of production, each of these quantities being estimated in terms of embodied labour.

to the *labour embodied* in its means of production.[35] In other words, Sraffa is postulating precisely the same relation between the average rate of profits *and the conditions of production in his 'standard' industry* as Marx was postulating between the average rate of profits *and the conditions of production in his industry of 'average organic composition of capital'*. What both economists are trying to show, in effect, is that (when wages are given) the average rate of profits, and therefore the deviations of price ratios from embodied labour ratios, are governed by the ratio of direct to indirect labour in the industry whose conditions of production represent a sort of 'average' of those prevailing over the economy as a whole. Marx reached this result by postulating as his 'average' industry one whose 'organic composition of capital' was equal to the 'social average'. But his result could only be a provisional and approximate one, since in reaching it he had abstracted from the effect which a change in the wage would have on the prices of the means of production employed in the 'average' industry.[36] Sraffa shows that the same result can be achieved, without abstracting from this effect at all, if we substitute his 'standard' industry for Marx's industry of 'average organic composition of capital'. Sraffa's 'standard' industry, seen from this point of view, is essentially an attempt to *define* 'average conditions of production' in such a way as to achieve the identical result for which Marx was seeking.

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[35] Cf. Sraffa, pp. 16-17. The reason for the equivalence of the value ratio and the embodied labour ratio is as follows: When profits are zero, the prices of all commodities are proportionate to the quantities of labour required to produce them (as has been shown above, pp. 125-6). And when profits rise *above* zero, the ratio R by hypothesis does not change. Thus whatever the level of profits the value ratio remains equal to the embodied labour ratio.

[36] Marx made this abstraction quite deliberately, and was fully aware that his result was therefore provisional and approximate. See *Capital*, Vol. III, pp. 241-3.

# THE CHURCH AND SOCIAL REFORM

In recent times both friends and foes of the organised Church have been concerned with what happened to its power and influence, or even on quite a lowly level to its membership, during the rapid increase in population and urbanisation in the nineteenth century. The problem may be tackled from different standpoints. At one level the study may be quite factual, of the numbers lost by emigration, or of the unfavourable contrast between the proportion attached to the Church (and consequently under its influence) in the rural areas against that in the new industrial concentrations. Whatever the type of analysis the conclusion now accepted is not that the Church lost the urban masses but that it never had them at all. But further, the study may take a deeper, more critical and more argumentative turn by suggesting that the Church was unaware of the problem, or, more accusingly still, that it did not care. To many this failure to answer or be concerned with the pressing needs of the new industrial society rather than any outright rejection of the faith through materialist influence explains the undoubted defection from the Church's ranks.

Dr. Mechie's study[1] is a notable contribution and corrective to thinking on these issues. His first two chapters give an excellent introduction to the social and economic history of his period. Thereafter the book examines, generally, but by no means exclusively, in biographical form, the contribution of a few churchmen to social reform. Inevitably and rightly Chalmers takes pride of place, but the less well-known appear too—James Begg and Housing, Patrick Brewster and Chartism, Henry Duncan and Savings Banks, John Dunlop and Temperance, Stevenson Macgill, David Stow, Thomas Guthrie, Norman Macleod, and others. Properly poor relief and education are reserved for more extended treatment because these were fields in which, as Dr. Mechie says, 'the Church could not be ignored by any citizen, not even by those who rejected its teaching and separated themselves from its worship and fellowship'.

To anyone, more particularly to Scottish churchmen, the book provides a worthy and inspiring record of achievement. Yet it still leaves the feeling, and it is one Dr. Mechie himself implies in his closing paragraph, that the record, for all its achievements, may be regarded as one of lost opportunities. Except for wondering if social

[1] Stewart Mechie. *The Church and Scottish Social Development, 1780-1870.* Oxford University Press. 1960. 25s.

concern was 'neither so intense nor so widespread among Scottish churchmen as could be wished', Dr. Mechie does not address himself specifically to this issue, quite rightly since it lies beyond the scope of this book. It is perhaps not illegitimate for someone else to offer thoughts, by no means conclusive, on that point, because in large measure one's judgment on the success or failure of the Church in its social witness in the nineteenth century depends on the answer given to that question. In this issue two factors seem particularly relevant. The first is whether Scottish churchmen made a different contribution to social reform than their English contemporaries against whom the criticism of having lost opportunities is more often made; the second is whether the Scottish churchmen were in effect much less successful in their approach to social reform than others in Scotland who approached these issues from a different ideological position.

Both the Scottish and the English streams of Christian social reform have much in common. Two characteristics combine most of the men discussed by Dr. Mechie and provide a further bond with a majority of the English Christian social reformers, whether of the generation of Wilberforce or of Shaftesbury. These were their common evangelical faith and their acceptance of the existing social and political structure. As with their English contemporaries, the theological and political views of the majority of the Scots were essentially conservative. In Scotland Patrick Brewster of Paisley Abbey was the notable exception on both counts (the personal antipathy between him and Chalmers is significant); in England it was the Christian Socialists. The impetus to the reforms of these men was therefore neither a spirit primarily concerned with social reform nor self-seeking desires, but a devout faith. Failure to grasp that this alone was the mainspring of their action, leads to a failure to appreciate the connection they saw between their faith and changes in society. Then it becomes possible to argue, as C. E. Raven did, that 'primarily they the Evangelicals were missionaries . . . and their mission aimed solely at individual conversions'. Hence, he continued, their doctrine 'became a mere device for repressing honest aspirations and obstructing every attempt at progress'.[2] This is a taunt which finds an easier target in the environment of English evangelicalism, with its aristocratic social background, than among the humbler, often clerical, reformers of Scotland. The accusation has been levelled against both. Yet it is probably irrelevant. Even if their theological position neces-

[2] C. E. Raven, *Christian Socialism, 1848-1854* (London, 1920), p. 10 and p. 12.

sarily prevented or precluded direct action to overturn society, or even the adoption of more democratic political action, and it is by no means absolutely certain that it did, to most this could not be a primary aim because it was not their way of reforming society. Their way was only through the prior revolution of individual conversion in peoples' lives. Chalmers was quite specific. 'It is our belief that through the medium not of a political change in the State, but of a moral and personal change upon themselves, there is not one desirable amelioration which they might not mount to.' This attitude explains why the nineteenth century evangelicals' approach differed greatly from that of other social reformers, even other Christian social reformers, and became increasingly so as the century progressed. It explains too why they spent much time on ecclesiastical matters—from Shaftesbury in his battles against the ritualists to James Begg in his battles against organs—time which, in the critics' eyes, would have been better spent in battles against social abuses. But it is not possible to suggest, as so many do, that this apparent ordering of preferences confirms the charge that the evangelicals were 'other-worldly', because no other approach or ordering of preferences could be tolerated within their beliefs. Therefore to criticise the evangelicals for spending time on ecclesiastical wrangling or, more fundamental, to suggest that a change in their conception of the function of social reform would have prevented the initiative for social reform from passing into secular hands is unreasonable.[3] Evangelicalism would then have lost its soul and the outcome might well have been less happy for society.

This common conception of the place of social reform among the nineteenth century evangelicals on both sides of the border is more striking because of a notable difference in the extent and effectiveness of the political action of the Scots and the English. In part this arose simply from differences in social thought. Shaftesbury accepted some form of state paternalism; Chalmers, though he claimed ecclesiastical authority over secular life, was in greater harmony with current economic doctrine. More important was the difference in social and ecclesiastical status. Shaftesbury did not consciously advocate a policy of state paternalism but simply exercised the political influence and privilege he regarded as his of right. He followed in the tradition clearly enunciated by Wilberforce, and acted on by him and his neighbours at Clapham—'my business is in the world, and I must mix in the assembles of men, or quit the part which Providence seems

[3] See for example J. L. & B. Hammond, *Lord Shaftesbury* (London, 1923), esp. pp. 261-276.

to have assigned me."[4] In Shaftesbury's mind his faith impelled no withdrawal from the political arena to an other-worldly life but only the re-orientation of political action. Whatever he considered might interfere with his divinely given political objectives, be it the offer of high office or of the Garter, had to be refused so long as these objectives were not wholly realised. To the Scottish social reformers these problems hardly arose. They had no such virtually automatic presentation of political opportunities as had Wilberforce, and his followers, or Shaftesbury, because of their less exalted social position. Furthermore, most of the Scottish leaders were ministers and so precluded from direct political action. As with the clergy in England, so the laity in Scotland played an important but secondary rôle. Thus in Scotland the massive nature of Chalmers' contribution was possible only because he inspired devoted assistance from laymen of the calibre of David Stow and William Collins, just as in England Charles Simeon on a national level and John Venn on a local level at Clapham played a part in the work of the Clapham Sect that has been too long neglected. But in Scotland the national impact of the evangelicals on social reform was bound to be less since there was no leading laymen among them who could claim political privilege as of right. The Scottish leaders, the ministers, could never hope to produce such an impact and to criticise them for their apparent failure at the national level is unjust. This offers an explanation of the silence of the Church courts on many issues. By their resolutions, virtually the only means of influence open to them, the Church courts could achieve only slight effect. A spearhead in Parliament was necessary and the Christian social reformers in Scotland did not have this. On the other hand, as an offsetting factor, the Scots' influence in local affairs was often much greater. Their glory was in the parish and in those fields, such as the poor law and education, where parochial influence was most effective.

Such difference in status and opportunity might have been expected to produce different responses to the democratic aspirations evangelicals are supposed to have ignored. But it did not. In both Scotland and England the evangelical social contribution passes, and the evangelical body of the later nineteenth century with the greatest social contribution, the Salvation Army, was vastly different in organisation, theology and methods from any of its antecedents. Why did the change come, then? Were the evangelicals changing? Was it that Christianity could not supply the answer to the problems of modern man, or, more

[4] J. C. Colquhoun, *William Wilberforce, His Friends and His Times* (London, 1867).

particularly, was it only the restricted views of evangelicalism that failed? These are the professed solutions of many. Yet one view remains, and to some at least it will be confirmed by Dr. Mechie's study. Whatever the defects of a dogmatic faith, it could supply a dynamic in life, as it did with Chalmers or, so conspicuously, with Shaftesbury. It seems significant that the chief contribution to Christian social reform in Scotland came from men who became or were Free Churchmen. The decline in social action may therefore have arisen not so much from the appearance of secular views of society but from the rise of theological liberalism. Was the Church itself to blame, though not by changing too little but rather too much?

A more accurate explanation of the failures of these social reformers may be quite simply that their policies were founded on inadequate and sometimes inaccurate analysis. In considering such a suggestion it is inevitable that Chalmers should be considered as making the most notable contribution. And in considering Chalmers it is—with justification—to the poor law that most attention is given. This may result in apparently much less stress than is their due being given to other aspects of Chalmers' social policy. But this is less distorting than it might seem to be. The poor law was one main branch of social policy where the opinion of the Church constantly impinged on the life of the people, while in the other, education, policy was in Chalmers' view, and in the practice of many others, closely related to that for the poor law. It could almost be regarded as an offshoot of poor law policy.

Chalmers' advocacy of certain characteristic features of the Scottish poor law—refusal of relief to the able-bodied, outdoor relief, and, most important of all, financing by voluntary means—does not mean simply an advocacy of reaction. By striving, however hopelessly, for a general adoption of the parochial conditions which he thought he had seen working ideally in rural Fife, Chalmers was in reality supporting change. The abolition of assessment implied not only the discontinuance of a practice which had become increasingly common in many Scottish parishes; it meant also the reversal of the views of some of his spiritual preceders, especially Andrew Thomson of St. George's, Edinburgh, and Stevenson Macgill, whom Chalmers followed at the Tron in Glasgow. Yet there has always been a tendency to regard Chalmers' work as reactionary and to give much of the credit for social development to the medical profession. Has this tendency gone too far? Were the medicals more effective?

To some it might seem that the most vulnerable part of Chalmers' whole position was his adherence to the traditional Scottish principle that help should not be given to the able-bodied poor. This long-standing tradition may be traced beyond the 1579 Act, basic to most Scottish poor law policy, to the first vagrancy laws of 1424-26, but it was a tradition which seemed to place an effective barrier against any measures to combat the effects of industrial unemployment. To this qualifications should be made. First, there was the traditional distinction, officially recognised since a Privy Council proclamation of 1693, between the ordinary poor, whose names were placed on the poor roll and were entitled to allowances permanently and of right, and the occasional poor, granted temporary allowances from the charity of the parish. The ordinary poor were those whom the Scottish poor law had always accepted as entitled to relief—the sick, the aged, the impotent; the latter were those who, through various kinds of temporary misfortune, found themselves in poverty even though sometimes able-bodied. The qualification is important, because it does indicate one way in which it became possible for the able-bodied to be given help, though, in the proper Scottish tradition, no recognition of any legal right was thereby implied. There was therefore a difference in rights; there need not have been a difference in relief. Even the General Assembly in 1839, while arguing for the retention of the old system, could hold 'that the situation of people, destitute of employment, was not to be overlooked, and that many cases might occur in which men of this class ought to obtain temporary relief, in times of occasional sickness or unusual calamity, although not as a matter of right'.[5] It is easy to argue that this was only a pious hope in the heavily populated areas of developing industrial Scotland. Certainly this increase of population was the most dramatic factor that may have made the old principles unworkable. But an earlier cause was the almost total destruction of the old social fabric of Scotland. Absenteeism, especially among the larger landowners, and dissent to other forms of presbyterianism and to episcopacy had ensured the end, even before the Disruption, of the virtual identity of kirk session and heritors. Chalmers' perception of this breakdown, of the end of the old patriarchal alliance between minister and laird, and of the consequential failure of the traditional social provision in Scotland, was the most accurate part of his analysis. His attempts to revive the alliance were therefore, within the limits of his analysis, an accurate remedy. It may be that any revival of the alliance was

[5] *Report by a Committee of the General Assembly on the Management of the Poor in Scotland, 1839*, p. 7.

inadequate to deal with the complex problems of an industrial society, but this Chalmers would have been unwilling to admit. At most he would have granted that criticism should be levelled against the failure to implement the system, rather than at the system itself. The apparent naivety to modern eyes of this analysis and solution should be lessened by one further factor. Chalmers never thought that the able-bodied thrown into distress by industrial fluctuations would be absorbed into the existing parochial system in the easy way the occasional poor were absorbed in a rural parish. He recognised that special provision was necessary. 'The distress arising from fluctuations of trade ought in fact to be committed to those impulses of public benevolence, which the occurrence of such fluctuations is ever sure to awaken', an impulse Chalmers felt sure would never be extinguished so long as it was not already 'weighed down by the burden of compulsory assessment'.[6]

It is easy to say this help was inadequate and did not really meet the problem. But if these qualifications are borne in mind it is more difficult to suggest that Chalmers was failing to provide for the problems of the new society any more than anyone else. Breaking through the barrier on giving help to the able-bodied poor, the characteristic which most distinguished the Scottish poor law from its English counterpart, was a major achievement not easily accomplished. Even W. P. Alison, who may be taken as the chief representative of the medical tradition, failed to make this break in spite of his major contribution to Scottish social welfare. Alison, and those who thought like him, made their contributions more effective by appreciating much more fully the type of society in which most people lived in Scotland and by holding that it was one in which the parochial system could no longer function successfully. Hence his frequent references to the complex state of society providing the chief problems of the poor law. Following in the Scottish tradition, Alison sharply disputed with the idea that outdoor relief should not be given, but he would have restricted outdoor relief specifically to widows and orphans and partially disabled men with families. The notable gap in his analysis is that he failed to extend this to cover help to the increasing ranks of the unemployed. Towards them—and this is probably the key to the extent of his ideas—his attitude generally remained punitive. For them he accepted the desirability of the workhouse to prevent any false claims. 'The true and simple security, I believe, lies merely in

[6] *Report of the Directors of the Town's Hospital of Glasgow on the Management of the City Poor* (Glasgow, 1818), quoting reply from Chalmers to their proposals, p. 47.

this—that in admitting such persons to a workhouse, you deprive them of liberty; you make them slaves in a land of freedom.'[7]

In one sense at least this was a more surprising, even more blameworthy, conclusion than Chalmers', as it virtually cut the whole ground from Alison's main argument, which was essentially empirical, and much simpler, less logical than Chalmers. He attacked poverty because he believed it was a main cause of the disease which had roused his interest in the subject. 'These repeated and severe visitations of fever . . . are not merely the *occasion* of much and widely spread suffering and destitution but . . . the *indication and test* of much previous misery and destitution.'[8] Yet the main cause of such poverty at that time was the destitution caused by unemployment, and this was well enough known in medical circles as the end of the cycle in 1837 had been marked by an increased incidence of fever in Glasgow.[9] Alison, it would seem, though with less justification, thought of the deserving able-bodied poor only in much the same restricted way as Chalmers, as they obviously appeared in the society of a rural parish.

It might seem, therefore, that in this crucial field of providing for the industrial unemployed, Alison did not achieve any advance over Chalmers. Is it possible then to stress any greater contribution by him and the medicals who thought like him? In one respect it does. The key to Chalmers' limitations is not so much his own spiritual or scriptural foundations, basic as that was to his thought, nor in his experiences in rural Fife, but in the influence of Malthus' population theory over him. To quote Dr. Mechie, 'the Malthusian cloud overshadowed Chalmers all the way'. Or, to quote Chalmers himself, 'Certain it is . . . that the produce of the soil cannot be made to increase at the rate that population would increase.'[10] This probably did not prevent Chalmers from seizing opportunities for social reform but rather conditioned the nature of his response. His whole scheme of social reform should be viewed as an attempt to combat the ultimate destructive effects Malthus predicted. His schemes were therefore basically educational attempts to prevent poverty and destitution. The spiritual regeneration he longed for was capable of breaking through many of the deadening effects of poverty. Even a critic had to admit there were cases of this at St. John's.

[7] W. P. Alison, *Observations on the Management of the Poor in Scotland* (Edinburgh, 1840), p. 110.
[8] Ibid., p. 10.
[9] R. Cowan, *Statistics of Fever in Glasgow in 1837*, reprinted in R. Cowan, *Vital Statistics of Glasgow* (Glasgow, 1838), pp. 33 ff.
[10] T. Chalmers, *Collected Works* (Glasgow), vol. 19, p. 36.

Alison's position was different. Whatever intellectual assent was given to the doctrines of Malthus, Alison's experience forced him into a different attitude towards social amelioration. To him 'the whole secret of the preventive check appears to me to consist in the growth and support of *artificial wants* among the poor'.[11] Or again, realising the importance of a higher standard of living in limiting population —'nothing short of a legal enactment can be relied on for uniformly and permanently securing such comforts during youth, as are essential to sustain these habits; and counteract that real *bounty of population* which accidents and misfortunes, and consequent destitution and degradation, would otherwise continually and inevitably bring on numerous families in every season and in every district of the country'.[12] The strength of Alison's position and achievement was in this effective refusal in practice to accept the conclusions of Malthus, whatever he may have said about their theoretical importance. To combat disease, destitution had to be removed and, from a comparative study of poverty, he believed its removal through more generous poor relief would not be inhibited by a popular form of Malthusianism, even though this involved illogicalities. Chalmers' position was different. He did see a solution through spiritual regeneration, but this was a solution which could be accommodated within the bounds of a strict Malthusianism.

The whole situation might be summed up rather differently by saying that at this time two main arguments were considering and explaining the problem of poverty—on the one hand, the population argument, dependent for most of its intellectual support on Malthus, and, on the other hand, the public health argument, which drew its inspiration on a purely empirical level from the squalid state of the towns. Chalmers represents the former; Alison the latter. Where the public health argument gained was in its implicit rejection of Malthus which meant that its proposals were not inhibited by fear of encouraging population increase. In brief, it was not afraid of spending money. Hence its approach was on a much broader front. To the medicals the problem of poverty was not simply a question of assessment or not; it was a problem of dirt and squalor as well. There is a natural tendency to be attracted by the undoubted achievements of the medical critics and sometimes to be impatient with anyone who failed to follow their line. It is certainly notable and commendable that in Scotland the medicals were attracted from a strict attention to sanitary measures, such as was typical in England,

[11] Alison, op. cit., p. 54.
[12] Ibid., p. 55.

to a wider concern with the poor law and other social provision, because the breakdown of the Scottish poor law made the destitution, which was their concern, more widespread. But this wider concern, while it produced a humane race of medical reformers in Scotland, did not necessarily give them the Christian charity of their opponents. True, many of them did have it, but it came from a different stream, from that represented by Chalmers. The scientific approach had its great advantages but it alone could not inspire the same type of service as Chalmers did in his assistants. Worse still, too easily it could lead to authoritarian bureaucracy. On the other hand, there is little doubt that, whatever the service Chalmers himself inspired, and it was considerable, the success of his work at St. John's is open to doubt, and, in the hands of lesser people, his views could very easily lead to comfortable inaction.

The greatest tragedy of all is that the two points of view could not be reconciled, as the individual care and inspired service of Chalmers on the one hand, when allied with the more generous financial provisions of Alison on the other, would have produced a system of social provision in Scotland far in advance of its time. Yet the failure by both to provide an analysis which accepted the new poor of the industrial unemployed within the framework of the old Scottish poor law left a gap in social provision that became increasingly important and dangerous. It was one which, not surprisingly in this environment, the Poor Law Commission of 1844 did little to fill. Though its appointment was precipitated by industrial distress it made little important change. Its most interesting and effective conclusions were in the medical provisions it suggested, partly a reflection of the force of the current medical criticism, partly through provision for the sick poor having always been approved and encouraged in Scotland. Even this had a flaw. Whatever success the Board of Supervision made of these provisions later, they failed to stress the relevance of preventive rather than curative medicine. A change of opinion, forced in large measure by the desire for self-preservation induced by epidemic, was necessary. The failures left the way open for the infiltration of and eventual domination by the ideas of the English poor law. Most conspicuously, the long-standing tradition of outdoor relief, with all its advantages, declined. Though in its first report the Board of Supervision stated that it 'had no power to sanction the abolition of outdoor relief in any parish, and that they must judge of the propriety of refusing to relieve a pauper otherwise than by admitting him into the poorhouse', in a few years' time the Board's report contained a perfect exposition, with commendation,

of the function of the English workhouse as a test. Not only were the numbers of unassessed parishes declining; all traces of the Scottish poor law were being removed. The Disruption had finally made the system unworkable, but it still was possible to carry on the Chalmers tradition of service, and it was in the Free Church that this was most noticeably done.

Were others more effective than the churchmen? Did the Church lose its opportunities for social witness in the second half of the nineteenth century? Perhaps it did. Perhaps this was, as many allege, because it failed to grasp the opportunities of the new democracy. But perhaps also it lost its initiative because of the too easy acceptance of current economic doctrine. Perhaps its real failure was therefore one of analysis. Perhaps it was dazzled by the economists.

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# INDICES OF HOUSE-BUILDING IN THE MANCHESTER CONURBATION, SOUTH WALES, AND GREAT BRITAIN, 1851-1913

WEBER'S building index[1] was based on data collected for a varying number of large towns, ranging from two in 1851, to six by 1856 and to 34 by 1900. The towns were drawn from all over Great Britain and their inclusion was due simply to the existence of statistics rather than to any consideration of representativeness.

Hamish Richards and I subsequently produced an index for house-building in the South Wales Coalfield[2] and showed that the fluctuations of this index differed appreciably from those of Weber's index. This paper presents another example of a regional index, based on data collected for the Manchester conurbation.

Dr. S. B. Saul has kindly given me data for a large number of other towns, mostly for the period 1890-1913. These have been incorporated, along with the South Wales and Manchester data, in a new version of Weber's index.

*South Wales*

A full list of the towns included in this index appears in the original paper by Richards and myself. Almost all of the statistics are of houses planned rather than built. To make subsequent combination of these data with those of other areas possible it has been assumed, on the basis of what information exists, that 85 per cent. of the houses planned were actually built, and a lag of six months has been introduced.

The actual index has been derived as follows. First an index for two towns covering the period 1852-1913 was derived, based on 1901-10 =100. Then an index for four towns, consisting of the previous two plus two others, was computed for 1856-1913, based on activity in these towns during 1901-10. In 1856 the value of the two-town index was 73·1 while the value of the four-town index was 81·6. To obtain a single index for the period from 1852 based on the maximum amount of data these two indices were spliced by multiplying the first three

[1] B. Weber, 'A New Index of Residential Construction and Long Cycles in House-building in Great Britain, 1838-1950,' *Scottish Journal of Political Economy*, Vol. II, pp. 104-32.

[2] J. Hamish Richards and J. Parry Lewis, 'House-building in the South Wales Coalfield, 1851-1913.' *The Manchester School*, Vol. XXIV, 1956.

years of the two-town index by 81·6/73·1. This procedure was continued whenever a new town appeared in the index. The result is a series which is based on an increasing number of towns. Because of the splicing it cannot be said that a value of 29·7 in 1860 indicates that building in that year was exactly 29·7 per cent. of building in the base period, but the method employed does have the advantage of introducing no spurious jumps in the index due to the sudden incorporation of extra towns.[3] The simplest statement of what the index does is that it shows the pattern of building in an increasing number of towns and, on the assumption that this pattern existed in other towns, it attempts to show the actual level of building in the whole area by means of a series of adjustments made necessary by incomplete coverage. Allowance was also made for boundary changes.

*The Manchester Conurbation*

All of the towns within the present boundaries of the Manchester conurbation were visited, and data were extracted from the Surveyors' Registers of Plans. For a few towns figures for actual buildings were available. The appendix lists the towns according to the years in which data became available for them. For Manchester itself there was a gap from 1871 to 1890. Values for the missing years were estimated from rating data and other material, in a way that will be described in another paper examining building in the Manchester area in more detail. The index for the whole area was computed in the same way as the South Wales index.

*Manchester and South Wales*

It will be seen from the chart that the two regional series differ appreciably and while at times they have similar movements at other times they exhibit inverse movements, as in the period 1855-1870. An attempted explanation of this and other points will appear in a later work. It is however an interesting point to notice that both of these areas had economies which were closely geared to foreign demands. As a first move towards the calculation of a building index in the 'export sector' we have calculated an index for the two areas together.

*Other Towns (excluding London)*

The next index is for Weber's Large Towns excluding those included in the above indices and also excluding London. It also covers

[3] In his original index Weber did not take this precaution, but the index suffers only slightly because of it. Anybody who wishes to see how building behaved in some of the principal sub-indices for a constant number of towns should consult the paper by Richards and myself.

St. Helens and the towns for which I obtained data from Dr. Saul. A list of these is given in the Appendix. Most of these data relate to houses erected. The significant point about this index is that it preserves the large booms of the early 'seventies and 'nineties shown by the Manchester and South Wales Index; but the peak of the early 'fifties is missing, the depression of the 'eighties is longer, and the decline after 1900 more sure. For Manchester the building cycle of approximately 20 years' duration can clearly be taken back to 1850 (and, as we hope to show elsewhere, perhaps even earlier) but in the total building for the other provincial towns of which we know there is only weak evidence of a cycle before about 1865. On the other hand, if we exclude the Manchester and South Wales areas the index relates to only four towns before 1855, which is the period in which we might expect a peak to occur.

*All Towns except London*

This series combines all the data we have except that for London. It is, in fact, a revised version of Weber's series of the same description, but heavily weighted in favour of South Wales and the cotton area.

*'All' Towns*

The addition of the London data based on a spliced version of Cooney's figures for Surveyors' Fees[4] and Spensley's series for houses built,[5] results in two fairly substantial changes. One is the existence of a secondary peak in 1869. The other is the conversion of the 1876 peak into a double peak 1876-81. The secondary peak of 1869 existed (with a margin of just one year) in other towns, including Bradford, Bolton and Birmingham, but its existence in the 'All' Towns index is due entirely to the inclusion of London. The fall from 1869 to 1873 was essentially a decline in Metropolitan building. On the other hand, the peak of 1876 appears in both of the regions we have studied, as well as in the aggregate for other provincial towns. It does not appear in the London series, in which the peak occurs at a time when building in almost every other town was at a low point. From about 1890 the inclusion of London affects the index but slightly. It is in 1890 that Dr. Saul's figures allow the enormous extension of coverage, so one must be careful about the conclusions one reaches here: on the other hand, the index in this period remains very similar to Weber's index for large towns.

[4] E. W. Cooney, 'Capital Exports and Investment in Building in Britain and the U.S.A.' *Economica*, N.S., Vol. XVI, 1949.

[5] J. Calvert Spensley, Urban Housing Problems, *Journal of the Royal Statistical Society*, Vol. LXXXI, 1918.

TABLE I

INDICES OF HOUSE-BUILDING ACTIVITY

| | (1) South Wales coalfield | (2) Manchester conurbation | (3) South Wales and Manchester conurbation | (4) 'All' towns excluding London, Manchester conurbation and South Wales | (5) 'All' towns excluding London | (6) 'All' towns | (7) Weighted index |
|---|---|---|---|---|---|---|---|
| 1850 | | | | 19·7 | 29·0 | 23·8 | |
| 1 | | 134·8 | 134·3 | 38·9 | 57·2 | 46·9 | |
| 2 | 72·6 | 190·9 | 190·2 | 50·9 | 79·4 | 65·2 | |
| 3 | 55·3 | 196·6 | 189·7 | 40·9 | 76·0 | 62·4 | |
| 4 | 37·7 | 105·9 | 104·7 | 33·5 | 49·4 | 40·5 | |
| 5 | 35·2 | 41·6 | 47·6 | 35·7 | 36·3 | 29·8 | |
| 6 | 43·4 | 27·3 | 37·6 | 41·7 | 37·9 | 31·2 | 37·2 |
| 7 | 42·3 | 24·3 | 35·3 | 35·5 | 33·4 | 27·5 | 33·7 |
| 8 | 48·9 | 29·3 | 41·4 | 39·0 | 37·7 | 34·4 | 37·1 |
| 9 | 43·7 | 31·5 | 40·1 | 40·5 | 38·1 | 35·2 | 38·8 |
| 60 | 29·7 | 37·9 | 36·9 | 38·8 | 36·0 | 37·7 | 37·9 |
| 1 | 21·0 | 56·5 | 43·3 | 39·9 | 38·8 | 41·2 | 39·3 |
| 2 | 11·7 | 60·7 | 41·2 | 49·3 | 43·9 | 41·3 | 47·6 |
| 3 | 7·9 | 61·4 | 39·7 | 54·0 | 46·4 | 50·1 | 52·1 |
| 4 | 10·3 | 55·6 | 37·5 | 58·9 | 48·7 | 57·0 | 54·9 |
| 5 | 16·6 | 55·6 | 40·7 | 48·1 | 43·0 | 53·1 | 48·7 |
| 6 | 22·5 | 53·2 | 42·0 | 50·3 | 44·9 | 58·4 | 51·4 |
| 7 | 25·9 | 58·6 | 46·8 | 58·0 | 51·3 | 65·8 | 57·7 |
| 8 | 24·8 | 65·1 | 50·6 | 64·7 | 56·6 | 69·3 | 64·1 |
| 9 | 22·0 | 83·8 | 61·4 | 75·0 | 66·5 | 78·9 | 70·1 |
| 70 | 22·7 | 88·7 | 64·8 | 83·3 | 72·7 | 72·0 | 75·2 |
| 1 | 23·6 | 87·3 | 64·3 | 87·6 | 74·9 | 65·2 | 77·1 |
| 2 | 26·6 | 89·9 | 66·9 | 91·3 | 78·1 | 70·1 | 82·0 |
| 3 | 36·3 | 96·0 | 74·3 | 83·6 | 80·4 | 60·1 | 75·0 |
| 4 | 48·3 | 110·5 | 87·8 | 97·1 | 93·9 | 67·2 | 86·5 |
| 5 | 61·0 | 141·6 | 112·2 | 120·5 | 117·8 | 85·0 | 108·0 |
| 6 | 62·4 | 169·7 | 130·7 | 135·0 | 133·9 | 100·4 | 123·0 |
| 7 | 47·6 | 168·2 | 124·6 | 124·7 | 125·1 | 99·4 | 115·9 |
| 8 | 37·2 | 136·7 | 100·8 | 103·0 | 102·6 | 94·1 | 99·4 |
| 9 | 31·4 | 94·7 | 71·7 | 76·6 | 75·2 | 90·5 | 80·2 |
| 80 | 36·9 | 69·9 | 57·6 | 69·5 | 65·5 | 93·0 | 75·9 |
| 1 | 42·8 | 58·4 | 52·3 | 70·3 | 64·0 | 95·1 | 76·8 |
| 2 | 39·8 | 51·7 | 47·1 | 69·2 | 61·2 | 87·0 | 73·1 |
| 3 | 49·2 | 53·0 | 51·5 | 72·7 | 65·0 | 84·3 | 74·5 |
| 4 | 62·5 | 53·3 | 56·7 | 74·1 | 67·9 | 79·8 | 74·2 |
| 5 | 62·2 | 61·1 | 61·4 | 67·6 | 65·7 | 72·6 | 68·3 |
| 6 | 60·5 | 65·1 | 63·3 | 67·0 | 66·0 | 64·8 | 65·4 |
| 7 | 59·9 | 63·7 | 62·2 | 71·4 | 68·4 | 66·6 | 68·6 |
| 8 | 54·6 | 61·7 | 59·0 | 70·3 | 66·5 | 65·4 | 67·3 |
| 9 | 50·5 | 64·0 | 58·7 | 70·5 | 66·5 | 64·2 | 66·9 |

TABLE I (*contd.*)

INDICES OF HOUSE-BUILDING ACTIVITY

| | (1) South Wales coalfield | (2) Manchester conurbation | (3) South Wales and Manchester conurbation | (4) 'All towns excluding London, Manchester conurbation and South Wales | (5) 'All' towns excluding London | (6) 'All' towns | (7) Weighted index |
|---|---|---|---|---|---|---|---|
| 90 | 58·3 | 67·2 | 63·7 | 64·7 | 64·3 | 61·1 | 62·9 |
| 1 | 70·6 | 62·8 | 66·3 | 64·0 | 64·6 | 63·5 | 63·6 |
| 2 | 76·7 | 65·3 | 70·4 | 70·5 | 70·4 | 65·7 | 68·0 |
| 3 | 86·6 | 69·8 | 77·2 | 79·5 | 78·8 | 73·9 | 76·5 |
| 4 | 96·9 | 77·9 | 86·2 | 79·4 | 81·2 | 75·6 | 77·8 |
| 5 | 98·5 | 88·4 | 92·6 | 80·7 | 83·9 | 77·9 | 79·9 |
| 6 | 102·1 | 118·8 | 111·0 | 93·5 | 98·2 | 93·5 | 94·6 |
| 7 | 106·1 | 137·4 | 122·8 | 107·9 | 111·9 | 105·4 | 107·8 |
| 8 | 89·6 | 146·6 | 120·1 | 132·6 | 129·8 | 127·3 | 129·8 |
| 9 | 73·1 | 142·3 | 110·2 | 131·4 | 126·4 | 128·7 | 129·6 |
| 1900 | 60·4 | 126·8 | 95·9 | 121·2 | 115·4 | 117·6 | 118·7 |
| 1 | 64·2 | 101·4 | 84·1 | 117·6 | 109·7 | 116·5 | 115·7 |
| 2 | 88·8 | 92·9 | 91·0 | 126·8 | 118·4 | 120·4 | 121·5 |
| 3 | 101·8 | 98·5 | 100·0 | 127·9 | 121·4 | 123·8 | 124·2 |
| 4 | 96·9 | 102·3 | 99·8 | 114·4 | 111·0 | 112·0 | 112·4 |
| 5 | 93·4 | 99·7 | 96·7 | 102·4 | 101·0 | 103·0 | 102·5 |
| 6 | 94·2 | 99·0 | 96·8 | 98·4 | 98·1 | 100·1 | 99·3 |
| 7 | 99·4 | 100·8 | 100·2 | 90·0 | 92·4 | 93·0 | 92·2 |
| 8 | 111·3 | 102·9 | 106·9 | 79·2 | 85·7 | 80·0 | 81·0 |
| 9 | 124·8 | 106·5 | 115·0 | 76·3 | 85·4 | 79·8 | 80·0 |
| 10 | 125·0 | 95·9 | 109·5 | 67·0 | 77·0 | 71·5 | 71·3 |
| 11 | 109·6 | 80·8 | 94·2 | 55·8 | 64·8 | 60·4 | 60·0 |
| 12 | 91·3 | 60·6 | 74·9 | 45·5 | 52·4 | 48·7 | 48·4 |
| 13 | 79·6 | 51·0 | 64·3 | 39·4 | 45·2 | 44·4 | 43·1 |

*The Weighted Index*

This attempts to present a truer picture of the fluctuations in the national total than that given by the unweighted 'All' Towns index, in which (in particular) London has a weight out of all proportion to its contribution to national building. In this final index the London, South Wales Coalfield and Manchester Conurbation indices have been given weights proportional to the contribution of net house-building in these areas to the net national increase 1901-11. It has then been assumed that the 'Other Towns' index can be taken as representative of the rest of the country, and the appropriate weight has been given to this. It is an assumption which is fairly reasonable from about

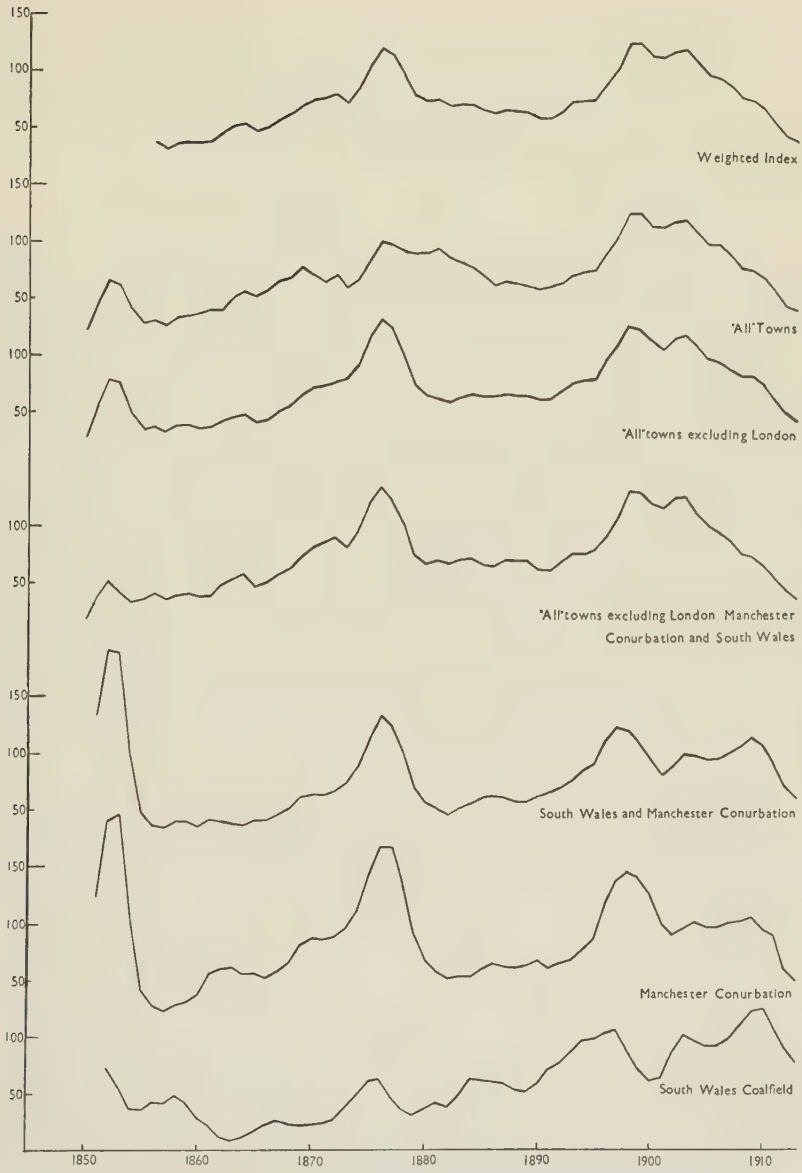


FIG. 1. Indices of House-building in Great Britain, 1851-1913.

1865 onwards, but may well be wrong for the earlier years. The weights given were London 16·3, South Wales Coalfield 5·5, Manchester Conurbation 8·6, Other Towns 69·6. It is hoped that perhaps one day other regional indices, such as perhaps one for the Birmingham area, may be incorporated into the weighted index by myself or somebody else.

*Conclusion*

The final index differs little from Weber's. It shows well defined peaks in 1876 and 1899, while it also shows that the decline in building in the late 'sixties was chiefly a London phenomenon. Indeed the whole pattern of London building is out of phase with that elsewhere. Whether there was a peak in the early 'fifties we cannot say. On the evidence we have, there seems to have been one in the Manchester area and in South Wales. There is some evidence of one in other towns, too: but not enough to prove the existence of a peak in any national total.[6] On the other hand, there is also evidence to suggest that perhaps the first half of the nineteenth century was marked by regional building cycles somewhat out of phase with each other, and synchronising even less than those we have here examined. This is a point which will be developed in another paper, which will show that there is some evidence for asserting that cycles of approximately 18-25 years' duration have existed in building since 1700, and that peaks probably occurred in most regions in the late 1840's or early 1850's.

It would be wrong to conclude this note without expressing my gratitude to the Town Clerks and Surveyors of a large number of towns, to Dr. Saul and Mr. Richards, to Mrs. Collins and Mrs. Watts who bore the burden of the computing, and to Mr. L. Simister who assisted me in the final stages.

J. PARRY LEWIS

*University of Manchester*

[6] Some support for the existence of a substantial peak in or near 1853 is given by the existence of a major peak in imports of lathwood into the U.K. in this year, when they totalled 16.671 fathoms. compared with 8.750 in 1849 and 9.611 in 1855. Imports of mahogany showed a sharp peak in 1852. See E. W. Cooney, 'Long Waves in Building in the British Economy of the Nineteenth Century', *The Economic History Review*, S.S., XIII, 2, 1960, pp. 257-269. An Index of the costs of building materials rose from 68·0 in 1851 to 82·6 in 1854. (K. Maiwald, 'An Index of Building Costs in the United Kingdom, 1845-1938', *The Economic History Review*, S.S., VII, 2, 1954, pp. 187-203.)

## Appendix

*Towns included in indices by first year of inclusion*

E = statistics of houses erected
P = statistics of houses planned
W = included in South Wales Coalfield index
M = included in Manchester Conurbation index

1850 Liverpool (E); Birkenhead (E 1850-74, P 1875-93, E 1894-1913).
1851 Manchester (M) (E 1851-69, 1890-1913. Estimates for 1870-89. See text).
1852 Swansea (W) (P); Cardiff (W) (P); Ashton-under-Lyne (M) (P).
1853 Bradford (P 1853-1889, E 1890-1913); Hull (P).
1855 Newport (W) (P); Aberdare (W) (P); Bolton (M) (P 1855-1896; 1897-1913).
1857 London (basically erections. See text); Merthyr Tydfil (W) (P); St. Helens (P 1857-89, E 1890-1913).
1859 Birmingham (P 1858-1900; E 1901-13).
1865 Glasgow (P); Altrincham (M) (P); Farnworth (M) (P); Hyde (M) (P).
1866 Burton-on-Trent (E).
1867 Stockport (M) (P 1866-99, E 1900-13); Salford (M) (P 1867-91, E 1892-1913); Oldham (M) (P); Llanelly R.D. (W) (P).
1868 Rochdale (M) (E).
1869 Gateshead (P 1868-99, E 1900-13); Newcastle (P 1868-80, E 1881-1913); Exeter (P); Mountain Ash (W) (P); Stalybridge (M) (P); Sale (M) (P); Bury (M) (P).
1871 Swindon (E).
1872 Stretford (M) (P 1872-90, E 1891-1913); Royton (M) (P).
1875 Nottingham (P 1874-81, E 1882-1913).
1876 Crewe (P 1875-99, E 1900-13); Leeds (E); Blaenavon (W) (P); Ebbw Vale (W) (P); Eccles (M) (P); Little Lever (M) (P); Whitworth (M) (P).
1879 Wolverhampton (P); Gloucester (P 1879-89, E 1890-1913); Penarth (W) (P); Bredbury and Romily (M) (P); Swinton and Pendlebury (M) (P); Worsley (M) (P); Urmston (M) (P 1879-90, E 1891-1913); Crompton (Shaw) (M) (P).
1881 Neath M.B. (W) (P); Tredegar (W) (P); Rhondda (W) (P 1881-97, E 1898-1913); Irlam (M) (P); Heywood (M) (P); Hale (M) (P); Failsworth (M) (P); Dukinfield (M) (P).
1882 Oldham (M) (E); Barnsley (E).

1886 Colchester (E); Sunderland (E); Derby (E); Chatham (P); Rhymney (W) (P); Neath R.D. (W) (P); Abertillèry (W) (P); Glyncorrwg (W) (P); Prestwich (M) (P); Middleton (M) (P).
1888 Sheffield (E); Burnley (E); Barrow-in-Furness (E).
1889 Preston (E); Bromley (E).
1890 Leyton (E); Dudley (E); Wimbledon (E); Bath (E); Smethwick (E); Middlesbrough (E); Macclesfield (E); Denton (M) (P); Littleborough (M) (P); Pontypridd (W) (P); Bedwellty (W) (P).
1891 Doncaster (E); Hornsey (E); Nuneaton (E); Warrington (E); Carlisle (E); Reading (E); Oxford (E); Lincoln (E); Accrington (E); Ogmore and Garw (W) (P); Maesteg (W) (P); Caerphilly (W) (P); Llantrisant (W) (P).
1892 Leicester (E); Coventry (E); Willesden (E); Enfield (E).
1894 York (E); Ilford (E); Brighton (E).
1895 W. Bromwich (P); Gillingham (P); Gelligaer (W) (P); Llanelly R.D. (W) (P).
1896 Shrewsbury (E); Gourock (E); Tottenham (E); Keighley (E); Ashton-on-Mersey (M) (P); Crickhowell (W) (P); Penybont (W) (P); Bridgend (W) (P).
1897 Eastbourne (E); East Ham (E); Sutton Coldfield (E); Norwich (E).
1898 Cowbridge (W) (P); Llwchwr (W) (P); Nantyglo and Blaina (W) (P); Droylsden (M) (P); Audenshaw (M) (P).
1899 Halifax (E); Nelson (Lancs.) (E); Edmonton (E); Hereford (E); Bristol (E); Bournemouth (E).
1900 Croydon (E); Huddersfield (E); Darlington (E).
1901 Mossley (M) (P); Hazel Grove and Bramhall (M) (P); Risca (W) (P); Pontardawe (W) (P).

# RECENT ECONOMIC TRENDS

## Economic Trends in North East Scotland

This note summarises the findings of an enquiry carried out during the summer of 1960. In general, information was obtained by interview, although occasionally, when this was not practicable, a questionnaire was used. In these ways information was obtained from some eighty individuals, including representatives of large and small firms, trade unions and local authorities.

The inclusion of large parts of North East Scotland in the development districts designated by the Board of Trade under the 1960 Local Employment Act gives official recognition to the area's unemployment problem.[1] Unemployment is well over twice the national average, being 3·6 per cent. in July 1960, compared with 1·3 per cent. for Great Britain. Moreover, there are considerable seasonal fluctuations which widen this gap. In Peterhead, for example, unemployment increased from 5 per cent. in August 1959 to a peak of 12½ per cent. in February 1960, falling back to 5 per cent. in June 1960. High unemployment exists despite high emigration, the low proportion of married women seeking employment, and the high proportion of children remaining at school beyond the minimum leaving age. The net movement of population from the North East is higher than that from Scotland as a whole and this movement seems to be gaining momentum:

| | Migration 1931-51 as percentage of 1931 population[2] | Migration 1951-9 as percentage of 1951 population[2] |
|---|---|---|
| North East Scotland | −8·5 | −6·1 |
| Scotland | −4·5 | −4·1 |

This is confirmed by an examination of the number of insured employees registered at Ministry of Labour Offices within the area at various dates:

[1] These areas are the Peterhead-Fraserburgh, Buckie-Banff areas (eligible for Government help under previous legislation) and the Stonehaven-Aberdeen-Inverurie area (newly qualifying for such help). In this article, by North East Scotland is meant the counties of Aberdeenshire, Kincardineshire, Banffshire, Nairn and Morayshire.

[2] Based on estimates contained in the 1951 Census Report and on information supplied privately by the Registrar-General for Scotland.

NUMBER OF INSURED EMPLOYEES (1948=100)

| | North East Scotland | Scotland | Great Britain |
|---|---|---|---|
| 1953 | 96 | 101 | 103 |
| 1956 | 98 | 104 | 107 |
| 1959 | 91 | 103 | 107 |

The principal reason for this exceptional unemployment and emigration is not hard to find. The North East is abnormally dependent on a group of industries in which employment is decreasing. In 1951 one person in five was engaged in agriculture, forestry or fishing, compared with one in twenty in the United Kingdom as a whole. Employment in these industries fell by 15 per cent. between 1948 and 1958. Reduced employment opportunities in these industries have not been offset by the introduction of new and growing industries.

This point is brought out clearly in Table I. Five rapidly expanding industries have, in total, made no impact on the employment situation in North East Scotland. (Another such industry of which this is true is vehicle-manufacturing. However, changes in the census data made it impracticable to include this industry in Table I.)

TABLE I

INSURED EMPLOYEES IN SELECTED INDUSTRIES
JULY 1948 AND MAY 1959

| | Great Britain | | North East Scotland | |
|---|---|---|---|---|
| | July 1948 | May 1959 | July 1948 | May 1959 |
| Chemical and allied industries | 421,000 | 522,000 | 1,566 | 1,399 |
| Metal manufactures | 496,000 | 582,000 | 96 | 149 |
| Engineering and electrical goods | 1,516,000[a] | 1,930,000 | 4,071[a] | 4,480 |
| Food, drink and tobacco | 692,000 | 797,000 | 13,366 | 12,310 |
| Paper, printing and publishing | 464,000 | 574,000 | 4,661 | 5,428 |
| | 3,589,000 | 4,405,000 | 23,760 | 23,766 |

[a] Estimated.

All six industries accounted at May 1959 for 24 per cent. of total insured employees in Great Britain as compared with 16 per cent. in North East Scotland. Possible reasons for this divergence are examined below, but first it is worth making two points about the industries which *have* expanded in North East Scotland.

First, the distributive trades account for a higher proportion of employees in North East Scotland (15·1 per cent.) than in Great Britain as a whole (12·5 per cent.). The main reason for this would seem to be the inefficiency of the distribution system in this area, as seen in a proliferation of roundsmen, and a lack of self-service facilities. Secondly, there are two groups of occupations which are of greater than average importance in the North East, and which offer a low proportion of jobs to male manual workers, the type of workers who are being released from the declining industries. These are the professional and scientific services, where a high standard of education is usually required, and the food, drink and tobacco group, where a majority of employees are women. Together these groups account for 19·6 per cent. of all employees, as compared with 12·5 per cent. in Great Britain as a whole.

We now turn to consider the reasons for this unfavourable industrial structure, and, in particular, why firms in expanding industries are reluctant to come to North East Scotland. The root of the matter is the geographical situation. The area is remote from the big centres of population, sources of raw materials and centres of research and fashion. It is not so easy to quantify specific factors.

Additional transport costs for finished products are zero if the markets are local, as they are for many of the products of the shipbuilding and engineering industries, or very small if the main markets are overseas, as for textiles and whisky. Where products are supplied to the United Kingdom market, they attract a wide range of freight costs, depending mainly on the ratio of value added to weight, but also on whether special tariffs can be negotiated. In the food-processing industry, for example, the North East Scotland branches of the large multi-plant firms have obtained from British Railways substantially more favourable tariffs than have their smaller competitors.

Freight costs vary from $\frac{1}{2}$ per cent. to 5 per cent. of manufacturer's selling price. At the lower end of the range are industrial drills, high quality cloth and lighting equipment. At the upper end are paper and food products. It is not possible to say by how much these costs would be reduced in alternative locations, but the cost of transporting finished products is not generally regarded as a serious burden.[3] A similar conclusion applies to the cost of materials. Many are procured locally —barley, fish, pork, etc.—others are imported—for the textile and fertiliser industries, for example. Even for those materials which do

[3] Manufacturers frequently expressed this opinion. One did not have to read between the lines.

not fall into either category, cost differentials, where they exist, appear to be of little importance.

Of greater importance, according to industrialists, is the cost of fuel. An examination of the prices of the three main industrial fuels—coal, oil and electricity—suggests that while North East Scotland is not *always* at a disadvantage, fuel prices in the area are, in general above those ruling in most parts of Great Britain. Table II, based on figures supplied by the National Coal Board, shows typical pit-head prices per ton of various grades of coal in selected divisions at September 1960.

TABLE II

PIT-HEAD PRICES PER TON OF COAL IN SELECTED N.C.B. DIVISIONS SEPTEMBER 1960

| | Scottish | North Western | East Midlands | West Midlands | South Eastern |
|---|---|---|---|---|---|
| Large | 90/8 | 96/11 | 76/1 | 93/9 | 134/2 |
| Graded | 85/11 | 95/2 | 76/4 | 82/- | 135/5 |
| Treated smalls | 77/11 | 86/2 | 60/4 | 74/- | 104/5 |
| Untreated smalls | 79/11 | 86/2 | 62/4 | 63/- | 86/5 |

These figures, selected to give a good geographical coverage, show that Scottish *pit-head* prices compare favourably with those of other parts of Great Britain. However, it is important to realise that at these prices, the Scottish division of the National Coal Board makes heavy losses. In other words, an additional real cost is incurred by the siting of coal-using factories in this area, a cost which is not revealed by such figures as these. Moreover, no account has yet been taken of the cost of transporting coal from the pit-head to factory. This factor adds some 30s. per ton to the cost of coal to the N.E. industrialist, and this might add anything up to 2 per cent. to production costs.

The distribution and pricing system for fuel oil varies slightly among companies, but certain general principles are observed. Oil is cheapest at the terminals, e.g. Hull, Grangemouth. From there it is transported by coasters to be stored in bunkers at such ports as Aberdeen and Peterhead, where a premium of 1d. to 3d. per gallon is payable. Finally oil supplied to inland towns and to ports without bunker facilities is priced according to the inland schedule. A further premium of upwards of 2d. per gallon is payable at such towns, e.g. Banff and Buckie.

The existence of these various schedules makes it difficult to say that North East Scotland is either better or worse placed than other areas. While the North East fisherman pays more for his oil than his

Hull counterpart, an Aberdeen industrialist would pay less than a Birmingham man. It is doubtful if it is worth while going further than this, since the schedules themselves are distorted by the granting of discounts for such considerations as bulk purchases.

Since there are 14 authorities selling electricity in Great Britain, all having variations in the nature of their tariffs, it is very difficult to assess the relative position of North East Scotland. However, the cost of buying electricity has been calculated for two factories in each of six areas. Consumption pattern (A) might be that of a small factory, employing 50-100 workers, e.g. a marine engineering works or a textile mill. Consumption pattern (B) might be that of a larger concern, employing 500-1000 workers, e.g. a heavy engineering works. The assumptions which are made are that high voltage supplies are used, that lighting does not account for more than 10 per cent. of total consumption and that the power factor is greater than 0·9. The tariffs were those ruling before the recent price increases.

TABLE III

COST OF ELECTRICITY CONSUMED BY TWO REPRESENTATIVE FACTORIES (£ PER MONTH)

Factory A: Maximum demand = 200KVA; Monthly consumption = 30,000 KW
Factory B: Maximum demand = 1000KVA: Monthly consumption = 150,000 KW

| Supplying authority[a] | Factory A | Factory B |
|---|---|---|
| Yorkshire E.B. | 194 | 937 |
| Midlands E.B. | 223 | 1083 |
| East Midlands E.B. | 236 | 1102 |
| North Eastern E.B. | 249 | 1212 |
| North of Scotland H.E.B. | 255 | 1275 |
| Southern (England) E.B. | 275 | 1316 |

[a]At the time of writing, London area tariffs had not been standardised.

Table III shows that North East Scotland is at a considerable disadvantage as compared to the majority of the areas which are likely to be attractive to industrialists. Moreover, this disadvantage increases with the amount of electricity consumed.

The brief examples given here show that additional lighting and power costs are incurred by building factories in the North East. How serious these costs are could be determined only by a detailed examination of individual cost structures. However, answers given by the managers of existing factories suggest that an additional burden of more than 1 per cent. of manufacturer's selling price would be the exception rather than the rule.

Extensive enquiries revealed little evidence that the manufacturers who were actually in the area considered themselves at a disadvantage because of their remoteness from centres of fashion or research. In the textile industry, where fashion plays so large a part, executives felt that their own designers were capable of meeting the needs of consumers, and that satisfactory communications with buyers were maintained by trade advertising and by regular visits to the main markets. Further, they did not consider their remoteness from the research centres at Leeds and Galashiels to be of much consequence.

In industries characterised by more rapidly changing techniques, such as engineering, one might expect close contact with suppliers, customers and research institutions to be more valuable. The North East lacks a tradition of scientific management. Manifestations of these are the shortage of scientists and technologists, the lag in the application of work-study and O. and M. procedures, and the rather antiquated forms of technical education available to apprentices. This means that firms moving into the area may have to be prepared to spend a considerable amount of time training workers. More important, it is essential that these firms should have access to information relating to current research, developments in the organisation and remuneration of labour, new techniques of production, etc. It is significant that the new factories which have been built in the area in recent years are all branches of existing firms, and acknowledge the debt owed by them to the parent companies.

The building of a branch factory will inevitably cause some increase in administration costs, in the duplication of office staffs, an increase in postage costs, etc. The manager of one such factory confessed that the telephone bill and the cost of entertaining were much higher than had been anticipated. At the two remaining factories, administration costs, although presumably higher than in the one-factory firm, were considered to be satisfactory.

Apart from certain advantages specific to particular industries—good water supplies for whisky distilling, a local market for the shipbuilding industry, and local supplies of fish for processing, for example—North East Scotland possesses two general advantages.

First, land is cheap and plentiful and rates are generally low. The importance of these considerations can be seen from the experience of a company producing canvas goods. Under Government pressure this Staffordshire company decided to build a branch factory in North East Scotland, whence it draws the bulk of its raw materials. It was offered several sites by Aberdeen Corporation, but eventually acquired land just outside the City boundary. It presumably considered the absence

of services on this site to be outweighed by the lower price of the land and the lower amount which would be paid in rates.

Second, labour costs are considerably below the national average. This is partly due to the fact that there is a close correspondence between actual wages and the union-negotiated rates. Of greater importance, however, is a higher level of output per head, the result of a conscientious attitude on the part of the workers. Good labour relations are also reflected in an absence of strikes and demarcation disputes, and in a very low labour turnover.[4]

Although the managers of the new factories in the North East[5] claim that their performance justifies the decision to locate there, it is doubtful if these decisions would have been made but for the promise of Government assistance. This assistance took the form of the building of factories by Scottish Industrial Estates, Ltd. The advantage of having a factory provided in this way was the saving in time and trouble rather than the saving in money. After laying down the specifications for the factory, the firm is able to order equipment, engage labour and begin production with the minimum of trouble.

The provision of factories is by no means the only contribution made by the Government to the economy of the area. General grants and loans have been received by the agricultural and fishing industries, local authorities have received special contributions towards their building programmes, and £117,000 had been offered by March 1960 under the terms of the 1958 Distribution of Industry (Industrial Finance) Act. Yet, as far as the encouragement of new enterprise is concerned, the provision of factories has been of paramount importance.[6]

*The net effect of location on costs*

It is much more difficult to assess the effect of location on the costs of all the firms within an area than within an industry. The reason lies in the greater difference between industries in the importance of such factors as freight charges, the price of fuel, frequent contact with suppliers, etc. However, a tentative conclusion is that the various disadvantages of North East Scotland as compared with, say, the Mid-

[4] Against this must be put the lower output per head during the early years in the newer industries which have to train workers. For example, both Euclid Ltd. and Cleveland Twist Drill Co. consider that it is at least 12 months before newly-engaged workers are fully proficient.

[5] These are A.E.I. Lamp and Lighting Co., at Buckie, and the Euclid (G.B.) and Cleveland Twist Drill Companies at Peterhead. Radiation Ltd. is also building a factory at Peterhead.

[6] Especially useful now would be the provision of training facilities for both apprentices and older men. This would reduce the heavy burden which at present falls on new firms in their early years.

lands—in particular, extra freight charges and dearer fuel—might add to costs as much as 7 per cent. of manufacturer's selling price or as little as 1½ per cent. Against this must be offset various savings—especially in the form of cheaper land and lower labour costs—which might amount to 4-6 per cent. of manufacturer's selling price.[7] Hence the overall effect on cost of locating in North East Scotland may be favourable or unfavourable. A very rough classification may be suggested. A cost disadvantage is incurred by many of the older industries, such as food-canning and paper-making, while a cost advantage is enjoyed by the newer industries, such as engineering. There are exceptions in each case: a new firm, even within engineering, will enjoy a cost advantage only if certain stringent conditions are fulfilled.

These figures refer only to those firms which have continued to operate in the area. A less favourable picture might be obtained if information could be obtained from the firms in the area which have failed and from those firms which expressed an interest in settling in the area, but decided not to do so. Unfortunately very little information of this nature is available. The firms which have failed recently have either been engaged in (or ancillary to) declining industries, such as fishing or granite working, or have been started with insufficient capital.[8] Comprehensive information about the second type of firm—the potential newcomer—can be obtained only from the Board of Trade, but the Board refuses to divulge any details about individual firms. Hence the investigator is deprived of a most promising line of approach.

On the assumption that Government assistance will continue to be available in the future, what type of firm might be expected to prosper in the area? In the first place, a branch of an established company would be much better placed than an independent company. The parent must be prepared to make available the results of its research and experience, to take considerable trouble in the training of workers,[9] and to wait for some time before enjoying a satisfactory return on its initial investment. The labour force could well be semi-skilled (employers consider North East workers to be particularly adaptable, even though so few have taken up an apprenticeship) and composed of men

[7] It is very difficult to obtain precise information about cost advantages. The most usual form of statement is: 'Our labour costs are the same as in many other parts of Scotland, but somewhat lower than in Southern England or the Midlands.'

[8] Maconochies, the Fraserburgh food-canning firm, have had a very chequered history recently. An important factor here is undoubtedly heavy transport costs.

[9] For example, Euclid Ltd. took several men off the bench and prepared them specially as training officers.

rather than women (there is considerable pressure in the market for female labour in many parts of the area). The product should have a high value/weight ratio, as with the drills and gear-box components manufactured at Peterhead. As far as the unemployment situation is concerned, the ideal factory for many towns and areas would employ 200-300 workers. Aberdeen, however, presents a different problem. Unemployment fluctuates around 3000 and the city could accommodate a much larger factory—or alternatively more smaller factories—than could the other towns. Industries which would seem to be appropriate are those making components for cars, steel kitchen equipment, metal toys, leather goods, high quality shoes, chipboard and paper products, such as packing cases. It is such industries as these that North East Scotland must obtain if the economic decline of the area is to be halted.

F. Livesey

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## CURRENT TOPICS

### An Editorial Farewell

This issue of the *Journal* is the last that will appear under my editorship. Since the Society drafted me nearly eight years ago I have been given plenty of rope and would not have been in the least surprised if the freedom with which I used it had brought my term of office to a much less agreeable conclusion. I have depended heavily on the goodwill of the Society's members, the forbearance of contributors and the unfailing competence of printers and publishers. With their help the *Journal* has won a place for itself which I am confident it will maintain.

The hopes with which it began have not altogether been fulfilled. We remain a small, relatively professional, society conducting its affairs informally and dependent for its solvency on the Scottish Universities and the Scottish Banks. We have not been able to establish that bridge with influential lay opinion in Scottish business and public life which was one of our original objects. Like other economic societies, we seem destined to give increasing weight to the priestly over the lay element in our affairs, not so much through the zeal of the priestly as the indifference of the lay. Yet we can take comfort, both from the rising circulation and reputation of the *Journal* and from the greater frequency of contact that is now maintained between economists working in Scotland. I think it possible also that the *Journal* may have made a marginal contribution to the improvement which I detect over the past decade in the level of public discussion of Scottish economic problems—low though that level remains.

It is a great source of satisfaction to me to be succeeded in the editorship by two distinguished Scottish economists whose names are already well-known to readers of the *Journal*. Donald Robertson, who succeeds me at Glasgow, was the author of an article in the very first issue and has contributed several articles since. Alan Peacock, who followed our President in the Edinburgh Chair, has always taken a keen interest in the *Journal*, has already acquired wide experience as an editor, and enjoys an international reputation. In bowing myself out of the editorial chair, I wish the two of them all success as they squeeze into it, and the same loyal support from the members of the Society which it has been my good fortune to enjoy.

A. K. C.

## ANNUAL GENERAL MEETING

### 17th April, 1961

The seventh Annual General Meeting of the Scottish Economic Society was held in the College Club, University of Glasgow, on 17th April, 1961. There were 46 members present. The meeting approved the election of Professor A. K. Cairncross as a vice-president, and Dr. T. L. Johnston was re-elected secretary. In proposing that Professor Cairncross should be appointed a vice-president, Professor A. L. Macfie thanked him for his work as Editor of the *Journal*, the success of which owed a very great deal to Professor Cairncross's efforts. The Society wished him every success in his appointment as Economic Adviser to H.M. Government.

The Editorial Board has appointed Professors Alan T. Peacock and D. J. Robertson as joint Editors of the *Journal* in succession to Professor Cairncross.

Membership of the Society remained stable in 1960. A further increase in sales to non-members and the larger subscriptions of the Scottish banks helped to reduce the deficit to be met by the University Courts from £139 to £112. The audited Accounts of the Society for the year ending 31st December, 1961, were approved by the General Meeting, and are printed on pp. 168 and 169 of this issue.

The local branches of the Society all arranged meetings on a variety of subjects during the winter, and in some branches there was a welcome attendance of non-members. It is hoped to develop further the interchange of visiting speakers between branches.

After the business meeting Professor A. K. Cairncross gave a paper on 'The Teaching of Economics', in which he particularly stressed the problems of specialist and general degrees in the subject, examined teaching methods, and considered the relative importance of theory and empiricism in teaching economics. The meeting concluded with an extended and stimulating discussion.

# SCOTTISH ECONOMIC SOCIETY

## Income and Expenditure Account

*Year ended 31st December, 1960*

### Expenditure

| *1959* £ | | | | |
|---|---|---|---|---|
| | *Scottish Journal of Political Economy* | | | |
| 575 | Net cost of Publication after crediting Sales to Non-Members and Advertising . . . | £563 | 3 | 9 |
| | Administrative Expenses | | | |
| 89 | Secretary's and Treasurer's outlays for stationery, postages and secretarial and administrative expenses . . . . . | 86 | 8 | 9 |
| | Branch Meetings | | | |
| 73 | Branch expenses in connection with Meetings—Hire of rooms, publicity and expenses . . | 74 | 0 | 0 |
| 737 | | £723 | 12 | 6 |
| 22 | Excess of Income over Expenditure for the year . . . . . | 50 | 19 | 9 |
| 759 | | £774 | 12 | 3 |

### Income

| *1959* £ | | | | |
|---|---|---|---|---|
| | Subscriptions | | | |
| 432 | Members . . . . . | £432 | 7 | 4 |
| 180 | 5 Scottish Bank Subscriptions: Bank of Scotland, British Linen Bank, Clydesdale & North of Scotland Bank, National Commercial Bank of Scotland, Royal Bank of Scotland | 210 | 0 | 0 |
| 3 | Sundry Income . . . . . | 5 | 19 | 0 |
| 5 | Interest on Deposit Receipt . . . . . | 14 | 0 | 1 |
| 620 | | £662 | 6 | 5 |
| 139 | Donation from Scottish Universities towards expenses of the *Scottish Journal of Political Economy* . . . . . | 112 | 5 | 10 |
| 759 | | £774 | 12 | 3 |

# SCOTTISH ECONOMIC SOCIETY

## BALANCE SHEET AS AT 31ST DECEMBER, 1960

| *1959* £ | | | | | *1959* £ | | | |
|---|---|---|---|---|---|---|---|---|
| | ACCUMULATED FUNDS . . . . . | | | £158 10 9 | | ASSETS | | |
| | Excess of income for the year to 31st December, 1960 . . . . . | | | 50 19 9 | | Cash at Bank: | | |
| 158 | | | | £209 10 6 | 54 | On Current Account . . . . . | | £14 1 2 |
| 72 | SUBSCRIPTIONS PAID IN ADVANCE . . . . . | | | 110 17 0 | 302 | On Deposit Receipt . . . . . | | 448 16 8 |
| | LIABILITIES | | | | 356 | | | £462 17 10 |
| 200 | Publishers for expenses of the *Journal* . . . . . | £163 3 9 | | | 2 | Cash in hands of Secretary . . . . . | | 3 3 3 |
| 51 | Treasurer and Secretary for stationery, secretarial expenses and outlays . . . . . | 50 0 0 | | | 139 | Donation requested from Scottish Universities towards expenses of the *Scottish Journal of Political Economy* . . . . . | | 112 5 10 |
| 16 | Local Branch outlays . . . | 44 15 8 | | | | | | |
| 267 | | | | 257 19 5 | | | | |
| 497 | | | | £578 6 11 | 497 | DAVID FLINT, Treasurer. | | £578 6 11 |

GLASGOW, 13th April, 1961.

I have audited the books and records of the Society for the year ended 31st December, 1960, and have found them to be sufficiently vouched and instructed.

I have examined the above Balance Sheet and annexed Income and Expenditure Account which are in agreement with the books and records; in my opinion the Balance Sheet shows the state of the Society's affairs as at 31st December, 1960, and the Income and Expenditure Account shows the excess of income over expenditure for the year stated.

JOHN A. STEWART,
Chartered Accountant,
Honorary Auditor.

## BOOKS RECEIVED

*Rubber and Railways in the Nineteenth Century,* by P. L. Payne. (Liverpool University Press, 30s.)

*A History of Economic Thought,* by Eric Roll. (Faber Paper Covered Editions, 12s. 6d.)

*Hire Purchase in a Free Society,* by Ralph Harris, Margot Naylor and Arthur Seldon. (Institute of Economic Affairs, Hutchinson & Co., 30s.)

*The Future of Purchase Tax,* by A. R. Prest. Hobart Paper No. 8. (Institute of Economic Affairs, London, 3s. 6d.)

*Revolution in Retailing,* by Christina Fulop. Hobart Paper No. 9. (Institute of Economic Affairs, London, 3s. 6d.)

*Growthmanship,* by Colin Clark. Hobart Paper No. 10. (Institute of Economic Affairs, London, 5s.)

*Carroll Wright and Labor Reform: The Origin of Labor Statistics,* by James Leiby. Harvard Historical Monographs, No. 46. (Harvard University Press. London: Oxford University Press, 38s.)

*Labor in Finland,* by Carl Erik Knoellinger. (Harvard University Press. London: Oxford University Press, 48s.)

*The Structure of the East German Economy,* by Wolfgang F. Stolper. (Harvard University Press. London: Oxford University Press, 80s.)

*Fiscal Theory and Political Economy,* by James M. Buchanan. (North Carolina Press. London: Oxford University Press, 40s.)

*American Suffrage from Property to Democracy 1760-1860,* by Chilton Williamson. (Princeton University Press. London: Oxford University Press, 48s.)

*An Immortal Commonwealth: The Political Thought of James Harrington,* by Charles Blitzer. Yale Studies in Political Science No. 2. (Yale University Press. London: Oxford University Press, 48s.)

*Malthus & Lauderdale,* by Morton Paglin. (Augustus M. Kelley, New York, $4.75.)

*Resources for the Third Five Year Plan.* Research Publication Series No. 2. (The Indian Merchants' Chamber Economic Research and Training Foundation, Bombay, Rs. 7.00.)

*Inflation in a Developing Economy.* Research Publication Series No. 3. (The Indian Merchants' Chamber Economic Research and Training Foundation, Bombay, Rs. 6.00.)

*New Horizons in Planning,* by Alak Ghosh. (The World Press (Private) Ltd., Calcutta, 18s.)

*Developments in Pakistan Economy since the Revolution,* by Anwar Iqbal Qureshi. (Nabeel Publishing House, Karachi, Rs. 5.00.)

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